THE DOCK & HARBOUR AUTHORITY

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Editorial Comments.

THE PORT OF BELFAST.

The progressiveness of the Port of Belfast is well illustrated by the fact that the Commissioners have decided on the building of a new dock on the Co. Antrim side of the River Lagan.

The dock when completed will increase the present facilities of the port by another 2,040-ft. of deep-water quays and a great asset in connection with this new scheme will be the construction of a channel giving direct access from the dock to the sea. The estimated cost of these undertakings will be £376,000.

The new dock forms the subject of this month's supplement and an illustrated article describing the port appears on another page.

NEW TILBURY DOCK OPENED.

On Thursday, September 26th, Lady Ritchie of Dundee officially opened the new works which have been constructed at Tilbury and which are under the jurisdiction of the Port of London Authority.

The new works comprise: a new entrance lock, 1,000-ft. long, 110-ft. wide, and with a depth of water at high tide of 45½-ft.; a dry-dock with a length of 750-ft. and which can if required be extended to 1,000-ft. A new passenger landing-stage is also under construction and will shortly be brought into use. The area of the main dock has been increased by a further 15 acres and an additional 800 lineal feet of quayage has also been provided.

The necessity for larger docks became evident with the building of bigger ships, and the Port of London Authority devised these new works with the object of attracting the larger cargo and passenger vessels to the Port of London, and the enterprise shown will undoubtedly be rewarded by a considerable increase in turn-over.

Competition between the principal ports of to-day to retain existing trade and to attract larger tonnage is very keen and necessitates the construction of new works and continual improvement to present facilities. The Port Authority, when contemplating the laying-down of new docks and other works has need to look ahead and to foresee what size and manner of ship will have to be dealt with in, say, two or three years time, and this in itself is no mean task.

The Port of London Authority has been in existence for a period of twenty years, and in that time has developed and extended the Port of London extensively, and no better proof of their success can be had than in the shipping figures. When the Authority first came into being the shipping figures were 13½ million tons, and to-day they have reached 55 million tons and go to prove that the go-ahead policy of the Port of London Authority is a successful one.

The cost of the new works at Tilbury just completed was about £2,550,000, and financial aid was given by the Government and the Unemployment Grants Committee.

Photographs of the new dry-dock appear on the next page.

MERSEY TUNNEL PROGRESS.

The Mersey Tunnel Committee has decided to widen by 20-ft., on both sides of the river, the entrances to the 44-ft. (main) tunnel, and the entrances to the 26-ft. 6-in. (branch) tunnel. On the £1,413,601 contract for the construction of the 44-ft. diameter iron-lined tunnel between the shafts at George's Dock, Liverpool, and the Morpeth Branch Dock, Birkenhead, the estimated value of the work accomplished to date is £742,602 3s. 8d. or 51.2 per cent. of the total. The enlargement of the original headings to the full-sized tunnel is proceeding at seven working faces and the total volume of excavation done to date is 147,308 cubic yards or 56.6 per cent. of the total 260,000 cubic yards in the contract. Of the cast-iron lining there are now in place 26,642 tons or 50.6 per cent. of the total 52,600 tons in the contract. This is almost 6 per cent. ahead of the scheduled programme. A start has been made with the construction of the lower half of the full-sized tunnel. A length of 30-ft. of reinforced roadway and air ducts has been placed under construction, in order to afford information of value before putting this part of the under-river work under construction. As to the contract for £749,075 for the construction of the full-sized tunnel on the Birkenhead side, the estimated value of the work accomplished to date is £56,061 5s. or 7.5 per cent. of the total. The work is in progress at eight points underground.

MANCHESTER SHIP CANAL TRAFFIC.

We have received from the Manchester Ship Canal Company the monthly approximate traffic returns for August. This shows receipts for the month of £115,359 against £112,091 in August last year, an increase of £3,268. In only one month so far this year have the traffic receipts fallen below those for the corresponding month of last year—though in all but one instance they have fallen below those for the corresponding month of 1927—and the total for the first eight months of this year is £973,701 against £953,876 for the corresponding period of 1928, showing an increase of £19,825.

A SHIP'S WIRELESS FEAT.

To the Biby liner " Staffordshire " falls the honour of being the first vessel to despatch a direct message to Ceylon from the English Channel across Europe. Remarkable speed, combined with accuracy, were also two of the features of the first direct message to Colombo, sent from the Channel, between Plymouth and London. The message was despatched from the " Staffordshire " at 4 a.m. on August 25th and was received at the Colombo Radio Station at 4.10 a.m. (both Greenwich mean time) on the same day. The Biby liner at the time was in the English Channel shortly after leaving Plymouth.

FIRE AT AVONMOUTH DOCK.

The Docks Committee of the Port of Bristol Authority beg to state that, notwithstanding the fire which occurred at Avonmouth on September 24th, there is no interruption of the general working of the docks.

As some of the Press reports are exaggerated it is desirable to say that the fire was confined to a shed containing empty sacks and a small quantity of general goods.

The supply of hirers' sacks was made good by starting time on the morning of September 25th, and the work of delivering grain has proceeded without delay.

THE UPPER WESER SHIPPING THREATENED.

A message from Minden, dated 12th September, states that since yesterday the water level in the Weser has fallen considerably, so that shipping is in great difficulties. As our correspondent learns on enquiry at the Waterways Authority, this is attributable to the fact that the water in the Eder reservoir has, in the meantime, sunk so low that extra water for the Weser must be curtailed.

Hitherto, thirty cubic metres per second supplied from the reservoir for the purpose of maintaining the Weser at middle low water. This flow of water must now be gradually diminished to only six cubic metres per second.

On this account it is to be feared that, in a few days, the water level will fall so low that the shipping on the Upper Weser will be completely at a standstill.

Vessels going upstream would do well to enquire about the water conditions.

The New Dry Dock at Tilbury.

An aerial view of the new dry dock at the Tilbury Docks which is just completed by the Port of London Authority. It is 750 feet long, 110 feet wide and can be readily extended when necessary, to a total length of 1,000 feet.

Photo by Aerofilms, Hendon.

A general aerial view of the Docks. The new Entrance Dock is seen at the far end of the Main Dock, and the new Dry Dock is seen towards the bottom left hand side of the picture.

Photo by Aerofilms, Hendon.

Madras Port Trust.

Administration Report for 1928-29.

GENERAL.

GENERAL.

The increase in the tonnage of cargo landed at and shipped from this port and in the tonnage of vessels that arrived at this port resulted in a corresponding increase in the revenue of the port. The increase in the revenue receipts during the first four months of the year was abnormal when compared with the corresponding period of the previous year. The increase in the subsequent months has not been so marked. The port can congratulate itself on having passed through a prosperous year.

VALUE OF TRADE.

The total value of the trade of the port as furnished by the Collector of Customs amounted to 5,202.07 lakhs of rupees, representing 48.64 per cent. of the aggregate trade of the Presidency, as against 46.18 per cent. in the previous year. Imports accounted for 4,279.86 lakhs and exports 922.21 lakhs. These figures are exclusive of Government transactions.

RECEIPTS.

The actual revenue receipts, including the contribution of Rs.60,000 made by the Madras Port Fund, amounted to Rs.49,55,974, the largest on record and an increase of 10 per cent. over 1927-8, the previous best year. The increase in revenue is due to the increase in the tonnage of both imports and exports landed at and shipped from this port.

WORKING EXPENSES.

The gross expenditure, inclusive of Rs.18,00,000 contributed to the three reserve funds, mentioned below under heading of Reserve Funds, amounted to Rs.64,77,293, as compared with Rs.49,69,147 in 1927-8. Excluding from gross expenditure the interest on loans, which in the year under review amounted to Rs.8,27,949, contribution to capital (Rs.8,68,833), repayment of debt (Rs.3,29,113), sinking fund (Rs.78,453), and amounts set aside for reserve funds (Rs.18,00,000), and omitting from the receipts Rs.60,000 contributed by the Madras Port Fund, actual working expenses came to 52.55 per cent. of the income, against 53.7 per cent. in the previous year.

SHIPPING.

Though the number of vessels that entered the harbour has decreased from 936 in 1927-8 to 896 in 1928-9, the total net registered tonnage has increased from 3,013,109 to 3,075,028, the largest in the history of the port. The average size in tonnage of each vessel has increased from 3,564 net registered tons to 3,663 net registered tons. The total number of vessels that entered the harbour during the past five years was 674, 717, 795, 936, and 896, and the number of vessels berthed at quays during the same period was 457, 540, 599, 680, and 631 respectively. The number of " quay days," or the number of days vessels were occupying the quays, for the past five years has been 1,505 days in 1924-5, 1,810 days in 1925-6, 1,729 days in 1926-7, 1,954 days in 1927-8, and 2,036 days in 1928-9. The vessel of the greatest tonnage which entered the port was the s.s. " City of Paris," of Glasgow, with 10,902 tons gross and 6,855 tons net register, and the vessel with the deepest draught was the s.s. " Badarpur," drawing 29-ft. Passengers to the number of 95,952 arrived at and 77,487 left the port, making a total of 173,439, against 232,356 during last year and 225,391 in 1926-7.

RESERVE FUNDS.

At the close of the year under review the Madras Port Trust Act was amended, permitting the Trust to open reserve funds. Pending the assent of the Governor-General to the Amending Act, the following reserve funds were opened with the approval of Government—vide G.O. Mis. No. 121, Finance (Marine), dated March 1st, 1929:—

1. The Revenue Reserve Fund.
2. The Renewal and Replacement Fund.
3. The Accident Fund.

The following amounts were transferred from the revenue balances to the above three funds:—

	Rs.
1. The Revenue Reserve Fund ...	12,00,000
2. The Renewal and Replacement Fund	5,00,000
3. The Accident Fund	1,00,000

SINKING FUND.

A sum of Rs.78,453 was contributed during the year towards the Sinking Fund for repaying the sterling loan of £330,000 raised in the London market in 1923, and this amount, together with the interest realised during the year on the Government securities purchased from the contributions of previous years, was invested in the 3½ per cent. Government securities. The total amount of the Government securities that stood to the credit of the Sinking Fund at the end of the year under review was Rs.6,06,400.

OUTSTANDING LOAN.

The outstanding amount of loans due to the Secretary of State for India in Council was Rs.1,31,80,241 at the close of the year under review.

TRAFFIC.

IMPORTS AND EXPORTS.

The total tonnage of imports and exports dealt with during the year under review amounted to 1,595,891, a record figure and an increase of 10.49 per cent. over the previous year, the tonnage for the previous four years being 1,444,342 in 1927-8, 1,133,412 in 1926-7, 1,159,834 in 1925-6, and 1,117,221 in 1924-5. Full details of the trade variations in the chief commodities dealt with in the harbour during the year as compared with the previous year are given in the paragraphs below.

IMPORTS.

The total tonnage of imports during the year amounted to 1,101,975, a record figure and an increase of 5.18 per cent. over the previous year. The chief items which contributed towards the increase are: Cement +11,185, coal +12,869, tanning substances +5,789, food grains other than rice +17,997, chemical manures +7,498, liquid fuel +11,182, benzine +12,159, lubricating and other mineral oils +3,370, paper and stationery +3,575, provisions +3,141, sugar and molasses +15,743, piece goods +1,579, gunnies +999, and tobacco unmanufactured +1,373. Decreases have been noticed against railway plant and rolling stock —37,752, rice —9,720, iron handled by the Trust —2,892, iron not handled by the Trust —7,787, coke —1,978, raw cotton —1,418. The difference between the total traffic and the quantity sea-borne consisted chiefly of rail-borne coal, which amounted to 6,120 tons, against 4,304 tons of the previous year. The above figures do not include 6,571 tons of railway-owned coal brought in for transhipment from broad to metre gauge.

COAL.

The tonnage of coal imported into this port during the year amounted to 296,473, or an increase of 4.5 per cent. over the previous year. Out of this quantity 6,120 tons came by rail and the rest by sea from Bengal. There were no imports of foreign coal. The major portion of the coal imported was loaded into wagons at the East Quay direct from the vessels, ensuring quick despatch and the minimum of transhipment losses. The tonnage of coal booked from the harbour by rail amounted to 260,938 in 1928-9, against 229,934 tons in 1927-8, 198,487 tons in 1926-7, and 245,143 tons in 1925-6. Details of coal transactions for the past seven years are given in Table " A " below.

COKE.

There was a setback in the imports of this commodity, the figure for the current year being 1,610 tons against 3,588 tons of the previous year. Of this quantity 82 tons came by rail, against 1,406 tons of the previous year.

TABLE " A."

——	1928-29.	1927-28.	1926-27.	1925-26.	1924-25.	1923-24.	1922-23.
	TONS.	TONS.	TONS.	TONS.	TONS.	TONS.	TONS.
Imports by rail	6,120	4,304	1,407	4,406	3,119	21,127	531
Do. by sea	290,353	279,300	244,832	285,652	284,784	267,547	253,505
The quantity put into ships' bunkers ...	9,445	24,964	27,930	25,357	24,036	28,551	29,981
Railway coal transhipped from broad to metre gauge wagons in the harbour	6,571	5,400	1,690	5,833	3,127	21,205	214
Coal booked from the harbour by rail ...	260,938	229,934	198,487	245,143	...	...	...

MINERAL OILS.

The imports of kerosene oil, representing 37 per cent. of all mineral oils imported, showed a reduction, the figure for the current year being 74,435 tons, against 76,093 tons for the previous year. Of this quantity Burma contributed 44,358 tons, or an increase of 8.13 per cent. over previous year's imports. The imports of foreign oil consisted of 3,384 tons from America, 3,014 tons from Singapore, 3,913 tons from Bal (Java), and 19,606 tons from Abadan (Persian Gulf), against 8,947, 18,508, 2,959, and 4,074 tons respectively of the previous year. Imports of case oil have fallen by 68.8 per cent., the figure for the current year being 265 tons. Imports of petrol (benzine) have advanced by 39.6 per cent., the figure for the current year being 42,858 tons. The large increase is due to the heavy motor traffic at Madras as well as in the interior. The entire quantity of petrol imported into this port came from Burma. Imports of fuel oil (liquid fuel) increased by 18.17 per cent., the figure for the current year being 72,714 tons. The large increase is due to heavier bunkering of oil-burning vessels and to its increasing use for agricultural and industrial purposes in place of coal. Out of this quantity 47,854 tons came from Abadan (Persian Gulf), 13,381 tons from Borneo, 6,198 tons from Singapore, and 5,281 tons from Sumatra.

TANNING SUBSTANCES.

The imports of tanning substances increased by 57.6 per cent., the figure for the current year being 15,832 tons. Ninety per cent. of this quantity, amounting to 14,307 tons, consisted of wattle bark imported from Natal for tanning hides, against 9,051 tons imported in the previous year. The marked increase noticed in the imports is due to its larger use for tanning hides on account of avaram bark being unobtainable in large quantities.

CHEMICALS.

Imports of chemicals showed an advance of 8.1 per cent., the figure for the current year being 10,149 tons.

CEMENT.

Imports of cement showed an advance of 94.5 per cent., the figure for the current year being 23,019 tons. The major portion came from Europe.

SUGAR AND MOLASSES.

The imports under "Sugar" have increased from 25, 276 tons to 41,047 tons—the largest on record—and is better than the previous best year, viz., 1918-19, by 1 per cent. Out of this quantity 89.8 per cent. came from Java, against 93.4 per cent. in the previous year, and 8.4 per cent. from Europe. The imports of molasses from Java for distillery purposes in the factories have not improved, the figures for the current year being 1,901 tons, against 1,929 tons of the previous year.

RAILWAY PLANT AND ROLLING STOCK.

The imports under this head have declined from 96,828 tons to 59,076 tons, or by 39 per cent. The large importation in the previous year was due to construction of new railway lines and the extension of the workshops at Perambur and Golden Rock.

TIMBER.

There was a slight fall in the import of teak during the year, the figure for the current year being 23,326 tons, against 23,680 tons of the previous year. Of this quantity 20,976 tons came from Burma, against 22,210 tons in the previous year, and 1,971 tons (Gurgan and Padouk logs) from Port Blair, against 1,440 tons in the previous year. There were no imports of Australian timber. Imports of other timber, including firewood and shooks, have also fallen, by 5.7 per cent., the figure for the current year being 7,630 tons. Firewood imported by country craft has fallen by 30 per cent., the figure for the current year being 3,993 tons. Tea shooks have, on the other hand, increased by 48.7 per cent., the figure for the current year being 2,986 tons.

MANURES OTHER THAN BONE.

The increase in the imports of chemical manures at this port amounted to 66.8 per cent. over the previous year, the figure for the current year being 18,723 tons. The increase is due to larger demand for agricultural purposes.

MOTOR-CARS, MOTOR-CYCLES, AND CYCLES, ORDINARY.

The number of motor-cars and 'buses imported during the year exceeded the previous year's record figure by 1,365 cars, or shows an increase of 39.3 per cent., the number imported during the current year being 4,836. Of this number 74 per cent. came from America and 22.5 per cent. from Europe. The increase is due to keen competition, fall in prices, and greater demand for these both at Madras and in the moffussil.

The importation of motor-cycles has fallen by 23.3 per cent., the number for the current year being 418. Practically the whole of these came from Europe. The importation of ordinary cycles doubled itself, the tonnage during the current year being 6,431, against 3,250 tons of the previous year. Practically the whole of this tonnage came from Europe.

Table " B " below shows the total imports under the above heads for the past eight years.

METALS.

The imports under this head have fallen by 10.8 per cent., the figure for the current year being 76,484 tons. Imports of brass, copper, and bronze increased by 73 per cent., the figure for the current year being 2,489 tons. The imports of iron and steel handled by the Trust fell by 9.8 per cent., the figure for the current year being 26,618 tons, while those not handled by the Trust fell by 17.5 per cent., the figure for the current year being 36,666 tons. Imports of lead showed an advance of 20 per cent. There was a slight fall in the imports of tin and tin-plates, the figure for the current year being 3,816 tons, against 3,916 tons of the previous year. Imports of other metals have advanced by 8 per cent., the figure for the current year being 5,051 tons.

Table " C " below shows the imports of iron and steel and tin-plates during the past seven years.

BULLION AND SPECIE.

During the year under review 1,029 cases sovereigns, 126 bars gold, and 615 bars silver were imported into this port, the corresponding figures in the previous year being 227, nil, and 539 respectively. Practically the whole of this came from South Africa by steamers bringing wattle bark cargoes.

TEXTILES.

The imports of raw cotton fell by 56.4 per cent., the figure for the current year being 1,095 tons. Twist and yarn have advanced by 5.5 per cent., the figure for the current year being 6,563 tons. Imports of piece-goods went up by 24.1 per cent., the figure for the current year being 8,130 tons. The increase is due to greater demand. Imports of gunnies showed an increase of 15.2 per cent. over the previous year, due to the unusually heavy groundnut traffic that passed through the port. Sixty-six per cent. were sent out of the harbour by rail to up-country. The imports under " Other Textiles " increased by 27.75 per cent., the figure for the current year being 3,922 tons.

MATCHES.

Imports of matches showed an increase of 1.4 per cent. over the previous year, the figure for the current year being 7,213 tons by measurement.

HIDES AND SKINS, RAW.

There was a further fall of the imports under this head of 17.8 per cent., the figure for the current year being 2,395 tons.

TABLE " B."

——	1928-29.	1927-28.	1926-27.	1925-26.	1924-25.	1923-24.	1922-23.	1921-22.
Motor-cars, vans, buses, lorries, Nos. ...	4,836	3,471	2,593	2,387	1,292	1,190	927	406
Motor-cycles, Nos.	418	545	314	292	200	107	119	79
Ordinary cycles, Tons	6,431	3,250	2,608	1,904	1,395	1,014	949	707

TABLE " C."

——	1928-29.	1927-28.	1926-27.	1925-26.	1924-25.	1923-24.	1922-23.
	TONS.	TONS.	TONS.	TONS.	TONS.	TONS.	TONS.
Iron and steel handled by the Trust	26,618	29,510	25,437	20,655	20,819	15,878	15,828
Iron and steel not handled by the Trust ...	36,666	44,453	46,566	32,710	37,675	34,883	45,883
Tin and tin-plates	3,816	3,916	2,834	4,858	4,934	4,694	6,448

LIQUORS.

The imports under this head showed an increase of 9.55 per cent. over the previous year, the figure for the current year being 5,861 tons.

PAPER AND STATIONERY.

The imports under this head increased by 22 per cent., the figure for the current year being 19,831 tons by measurement.

PROVISIONS AND OILMAN STORES.

The imports under this head showed an advance of 44.2 per cent. over the previous year, the figure for the current year being 10,245 tons.

GLASSWARE.

The imports of this commodity have advanced by 7.2 per cent., the figure for the current year being 17,369 tons.

HARDWARE.

The imports of this commodity have exceeded last year's record figure by 7.8 per cent., the figure for the current year being 15,632 tons.

MACHINERY.

The imports under this head fell by 4.24 per cent., the figure for the current year being 11,997 tons.

RICE AND FOOD GRAINS.

The imports of rice during the year have fallen by 10.12 per cent., the figure for the current year being 86,291 tons. Of this quantity 41,089 tons came from Burma, against 71,573 tons in the previous year, and 42,210 tons from Indo-China, against 23,258 tons in the previous year. The imports of other food grains, including pulses and flour, showed an advance of 41.8 per cent., the figure for the current year being 61,042 tons.

TOBACCO.

The imports of tobacco unmanufactured, mostly leaf tobacco, showed an advance of 60.3 per cent. These came from the United States of America for the manufacture in Southern India of the various brands of cigarettes. Imports of manufactured tobacco doubled, the figure for the current year being 1,977 tons by measurement.

MISCELLANEOUS.

Imports of building materials other than cement increased by 25 per cent., soap by 23.2 per cent., and Government stores by 5.7 per cent. On the other hand, spices fell by 31 per cent., vegetables oils by 7.4 per cent., and fodder by 5.5 per cent.

EXPORTS.

The total tonnage of goods shipped from this port during the year under review amounted to 493,916 tons—a record figure—against 396,688 tons of the previous year, or an increase of 24.78 per cent. The main items which contributed towards the increase are:—Groundnuts, +78,387, scrap iron +7,392, onions +4,362, raw cotton +3,007, tobacco unmanufactured +3,851, and oil-cake +1,742. Decreases were noticed, on the other hand, chiefly against provisions — 1,974 and vegetable oils — 1,949.

GROUNDNUTS.

The tonnage of this most important staple article, which was shipped from this port during the year on a larger scale than any other single produce, forming 69.75 per cent. of the total exports of the port, amounted to 345,221 tons, or an increase of 29.38 per cent. over the record figure of the previous year. The area sown in 1928 is the highest on record, and the yield is also the highest on record, being 3 to 4 per cent. better than last year due to good timely sowing rains. The large increase in the shipment of this traffic from this port is due to the increasing demand from abroad and to the fairly remunerative prices offered for it. Europe took 94 per cent. of the total quantity shipped from this port, or an increase of 25.6 per cent. over the previous year's shipments. Exports coastwise have advanced by 89.2 per cent. Trade with Singapore showed a revival, the shipment for the year being 7,047 tons, against 1,169 tons of the previous years. Table " D " below shows the shipment of this traffic during the past seven years.

TOBACCO.

The shipment of unmanufactured tobacco has advanced by 58.5 per cent., the figure for the current year being 10,434 tons by measurement; 92.6 per cent. went to Europe, and 5.9 per cent. to Rangoon. Shipment of manufactured tobacco advanced by 4.17 per cent., the figure for the current year being 3,997 tons by measurement.

SCRAP IRON.

The shipment of this commodity has advanced considerably during the year, as will be seen from Table " E " below, which gives the figures for the past five years; 90 per cent. of the scrap iron shipped from this port went to Japan, and the rest to Europe.

RAW COTTON.

The shipment of this commodity has improved by 19.2 per cent. over the previous year, the figure for the current year being 18,629 tons by measurement; 69.3 per cent. went to Europe, and 20.8 per cent. to Calcutta.

ORES.

There was a further fall of 3.8 per cent. in the shipment of this commodity, the figure for the current year being 13,656 tons, against 14,195 tons of the previous year. Table " F " below shows the shipment of the several kinds of ores during the past seven years.

ONIONS AND OTHER VEGETABLES.

The shipment of onions from this port has exceeded last year's record figure by 20.5 per cent., the figure for the current year being 25,667 tons; 48 per cent. went to Rangoon, 26.7 per cent. to the Straits Settlements, and 22.2 per cent. to Calcutta. Shipments of fruits and vegetables consisted of potatoes, tamarind, lime, and mangoes. Only 33,993 baskets of mangoes were shipped from this port during the year, against 137,629 baskets in the previous year.

TABLE " D."

	1928-29.	1927-28.	1926-27.	1925-26.	1924-25.	1923-24.	1922-23.
	TONS.	TONS.	TONS.	TONS.	TONS.	TONS.	TONS.
Shipments to Europe	324,750	258,570	152,688	158,444	138,352	81,875	92,039
Do. Singapore	7,047	1,169	...	...	...	1	...
Do. Coast ports	13,424	7,095	10,831	4,704	9,852	4,120	2,222
Total ...	345,221	266,834	163,519	163,148	148,204	85,996	94,261

TABLE " E."

	1928-29.	1927-28.	1926-27.	1925-26.	1924-25.
	TONS.	TONS.	TONS.	TONS.	TONS.
Scrap iron	10,278	2,886	500	725	1,337
Pig and hoop iron	944	1,034	801	1,916	1,362
Iron sleepers	3	...	...	1,001	1,561

TABLE " F."

	1928-29.	1927-28.	1926-27.	1925-26.	1924-25.	1923-24.	1922-23.
	TONS.	TONS.	TONS.	TONS.	TONS.	TONS.	TONS.
Chrome ore	6,317	3,880	5,000	12,621	11,506	10,396	26,439
Magnesite	7,289	10,315	11,184	12,815	11,478	7,671	9,142
Manganese and others	50	...	...	...	5	3,012	...
Total ...	13,656	14,195	16,184	25,436	22,989	21,079	35,581

HIDES AND SKINS.

The export of raw hides and skins from this port has advanced by 36.2 per cent., the figure for the current year being 1,744 tons. Export of tanned hides and skins advanced, on the other hand, only by 1.4 per cent., the figure for the current year being 21,538 tons. Out of this quantity 87.6 per cent. went to Europe, 8.1 per cent. to America, and 2.2 per cent. to the Straits Settlements.

OIL-CAKES.

The shipment of this commodity, consisting of sesamum and groundnut cakes, nearly doubled itself, the figure for the current year being 3,717 tons.

VEGETABLE OILS.

The shipment of this commodity, consisting of cocoanut and groundnut oils, showed a further fall, the figure for the year under review being 1,236 tons against 3,185 tons of the previous year.

BUNKERS.

During the year under review 9,445 tons of coal and 36,757 tons of liquid fuel were shipped from this port for bunkers as compared with 24,964 tons and 31,811 tons respectively in the previous year.

TEA.

The shipment of this commodity remained practically the same as that of last year, the figure for the current year being 2,996 tons by measurement.

MANURES.

The shipment of bone manure has declined by 15.7 per cent., the figure for the current year being 1,084 tons. Shipments of other manures, including acetate of lime, have, on the other hand, advanced by 49.4 per cent., the figure for the current year being 4,201 tons. Shipment of acetate of lime increased by 54 per cent., the figure for the current year being 1,825 tons.

PIECE GOODS.

The shipment of piece-goods, consisting mainly of coloured piece-goods such as sarees, lunghis, Madras cloth and Madras handkerchiefs, showed a slight increase of 5.57 per cent. over the previous year, the figure for the current year being 6,423 tons. Of this quantity 36 per cent. went to the Straits Settlements, 24.86 per cent. went to Calcutta, 19.68 per cent. to Rangoon, and 17.9 per cent. to Europe.

PROVISIONS.

The shipment under this head, consisting of ghee, pickles, condiments, dry mutton, eggs, etc., showed a fall of 30.7 per cent.

MATTERS OF GENERAL INTEREST.

SCALE OF RATES.

During the year the statement of services and conditions attached to such services have been amended with the sanction of Government three times as enumerated below:—

(1) The rates of quay dues on cargo for which overside delivery orders have been issued by the steamer agents have been altered.

(2) An all-round rate of harbour and quay dues has been fixed on stores imported or exported at the port by railway companies as defined by the Indian Railways Act, 1890 (IX. of 1890), or working State Railways or by Government or others on behalf of such companies.

(3) A uniform rate of rent has been fixed for all warehouses other than the one south of the Anchor Road whether double-storey or single at Rs.4—8—0 per 100 square feet or part thereof per calendar month or pro rata for part thereof.

RAILWAY WORKING.

The railway traffic handled during the year under review amounted to 768,021 tons in 55,233 broad gauge wagons inwards and outwards, and 194,243 tons in 27,941 metre gauge wagons inwards and outwards, aggregating in all 962,264 tons. The harbour terminals and the freight collected on behalf of the two connected railways on the above traffic for the past four years are given in Table " G " below.

CONGESTION.

One of the outstanding features of the port's work during the last year has been the rather frequent recurrence of periods of congestion in the Trust's transit sheds, on the quays and in warehouses.

The cargoes mainly responsible for this congestion are groundnut exports and imports of machinery and railway materials. Every endeavour is being made by the port to speed up the clearance of railway materials and machinery imported, and it is hoped that improvement in despatch will eliminate congestion caused by this cargo. That caused by groundnut exports is another matter and can only be met by an extension of the port facilities which can be provided as soon as the Port Trust is able to develop the southern extension, for the grant of which Government has been approached.

DISCHARGE OF PETROL IN BULK FROM TANKERS BY NIGHT.

The restriction imposed on tankers with regard to the discharge of petrol by night, was removed during the year on the recommendation of the Chief Inspector of Explosives in India, and tankers can now discharge petrol in bulk either alone or simultaneously with non-dangerous petroleum in bulk continuously by day and by night.

CYCLONIC STORMS.

During the year the port was seriously threatened by storms on two occasions, once on the 24th to the 25th December, 1928, and again on the 5th to 7th January, 1929, but no material damage was done either to the property of the port or to shipping.

ENGINEERING.

NEW DEEP-WATER QUAY: ESTIMATE Rs.12,00,000.

During the year 17 piles were built, making a total of 447 piles manufactured up to the end of March, 1929. Of these piles, 290 have been sunk, leaving a balance of 157 on hand. Decking work is completed for about 324-ft. out of a total of 648-ft. Pile sinking was stopped during the year owing to an accident to the timber sheer legs. A new pair of steel lattice sheer legs is on order with Messrs. Braithwaite and Co., Ltd., Calcutta, and was expected to arrive at the end of May, 1929.

CONSTRUCTION OF A NEW BREAKWATER FROM THE SOUTH-EAST CORNER OF THE HARBOUR: ESTIMATE Rs.9,00,000.

Thirty-seven wave-breaker blocks (33 of the standard 31-ton weight and four of 20-ton weight) were tipped along the sand screen during the year. As there are still some gaps to be filled up, which will require ten more blocks, tipping of these will be completed during the financial year ending March, 1930. It was noticed that during the cyclone season in the year under review a few of the wave-breaker blocks at the east end settled slightly.

The mass concrete capping is practically complete except for the filling up of a few crevices at the head which could not be filled earlier owing to unfavourable tides. It is expected that this work will also be completed in the year 1929-30.

TWO NEW WAREHOUSES AT THE SOUTH ACCRETION: ESTIMATE Rs.4,00,000.

Both warehouses, built of wedged stone, have been completed and handed over to Messrs. Louis Dreyfus and Co. for occupation. Railway crossings serving the warehouses at the southern and northern ends were expected to be laid before the end of June, 1929.

REPAIRS TO CYCLONE DAMAGES: ESTIMATE Rs. 1,15,000.

During the cyclone season of 1927 some settlement occurred of the wave-breaker blocks protecting the outer breakwater and sheltering arm. 170 blocks (31-ton weight) of the standard type were made during the year, of which 146 were tipped and the balance will be deposited before the next monsoon. At places where blocks could not be tipped 29 special blocks of varying sizes were cast in situ.

COOUM PUMPING SCHEME.

The Cooum pump installation was brought into use about the end of July, 1928.

TABLE " G."

	1928-29.		1927-28.		1926-27.		1925-26.	
	Madras and Southern Mahratta Railway.	South Indian Railway.	Madras and Southern Mahratta Railway.	South Indian Railway.	Madras and Southern Mahratta Railway.	South Indian Railway.	Madras and Southern Mahratta Railway.	South Indian Railway.
Tonnage	768,021	194,243	625,584	244,458	457,313	195,633	527,846	184,617
Freight, Rs.	63,45,360	11,01,439	48,22,695	9,98,784	32,75,921	7,87,511	35,51,994	6,81,119
Harbour terminals, Rs. ...	3,45,755	94,246	2,72,776	1,17,876	2,15,395	93,832	2,29,202	80,895

TUG " RANGER."

The tug " Ranger " was towed down to Madras by s.s. " Winkfield " and completed her fitting out here. The vessel was built in Calcutta by Messrs. Burn and Co., Howrah, under the supervision of the Lloyds Surveyor.

EXTENDING THE ACCOMMODATION OF THE SPRINGHAVEN SHED AND EFFECTING CERTAIN IMPROVEMENTS TO THE ENVIRONS OF THE SHED: ESTIMATE Rs.28,000.

The extension of the shed (210-ft. long) was completed in August, 1928.

CONSTRUCTION OF AN OPEN-SIDED SHED FOR GROUNDNUT TRAFFIC AT THE NORTH END OF " Z " SHED OF THE MERCHANTS' WAREHOUSES: ESTIMATE Rs.28,000.

An open shed (100-ft. by 90-ft.) was constructed during the year, north of the merchants' warehouse " Z " shed. This work was started in November, 1928, and completed in January, 1929.

RENEWING THE ROOF OF TRANSIT SHED No. IV.: ESTIMATE Rs.69,000.

The old corrugated galvanised iron sheets of the roof of the shed were removed and replaced by " Fibro-five " corrugated asbestos sheets.

PROVISION OF FIVE UNITS OF STAFF QUARTERS FOR THE HARBOUR MASTERS ON THE SITE OF THE BIDEN HOUSE IN THE MADRAS HARBOUR: ESTIMATE Rs.1,70,000.

Materials required for this work, such as bricks, teakwood scantlings, asbestos sheets, etc., were collected during the year. An outhouse consisting of three motor garages and one pilot boatman's room were completed during the year under review.

MEXPHALTING A PORTION OF THE HARBOUR STATION ROAD AND A PORTION OF THE SPRINGHAVEN ROAD (EAST) IN THE HARBOUR: ESTIMATE Rs.42,000.

A length of about 800-ft. of the road east of Springhaven Shed was mexphalted during the year.

ADDITIONAL MACHINES FOR WORKSHOPS.

Among the machine tools purchased for the workshops during the year, the electric welding plant is of particular interest, as this is the first of its type to be introduced in India and has proved most satisfactory.

ROLLING STOCK AND LOCOMOTIVES.

In order to obtain the advantages of standardisation three new six-coupled locomotives identical in all respects with the two previously obtained from the same firm were ordered from Messrs. The Hunslet Engine Company of Leeds. It is interesting to note that these locomotives were shipped out completely assembled and within three days of landing at Madras were out working on the line.

During the year a large number of wagons were repaired, particular attention being paid to the high sided wagons which are subjected to the action of sea spray on the east quay.

MOTOR LORRY.

Owing to the large amount of construction and maintenance work now in progress, it was found necessary to purchase a 1¼-ton Fiat lorry to expedite the collection and delivery of materials.

HEAVY LIFT CRANES.

During the year the 15-ton gantry crane was completely overhauled, both mechanically and structurally. On completion of this work reconditioning of the 33-ton new all-round Titan crane was undertaken in February, 1929, and is still in progress. This is the first complete overhaul the new all-round Titan crane has had, as, until the lay-by was constructed at the root of the Sand-Screen, it was not possible to block up this crane and thoroughly examine and repair every part of the structure and machinery.

PETROL ELECTRIC CRANE.

A 3½-ton petrol electric mobile crane, costing slightly over Rs.17,000, was purchased during the year and is doing useful work on the west quay, chiefly in connection with the stacking and removal of cargo at places inaccessible to steam and other cranes.

HYDRAULIC POWER HOUSE.

An estimate for Rs.95,000 was sanctioned during the year for replacing the almost worn-out steam-driven plant in the hydraulic power house by electrically driven turbine pumps and for the necessary transformers, switchgear and other auxiliaries. This conversion to electric drive is expected to reduce the cost of maintenance of the power house and also the working charges of the hydraulic cranes considerably. The materials connected with this work are on order, and delivery was expected to commence early in June, 1929. It is hoped to complete the conversion before December, 1929.

NEW TIDAL OBSERVATORY.

This was completed during the year, and the tide registering instruments were removed to the new building under the supervision of an officer from Dehra Dun. The old building has been demolished.

DREDGING.

The suction dredger " Madras " worked for 189½ days during the year, of which 69¾ days were spent in maintenance dredging and the remaining days in capital dredging in deepening the harbour to 32-ft.

DREDGING STATISTICS.

The table below gives the quantity dredged during the year and progressive totals:—

Particulars.	Unit.	Dredger "Madras." 1928-1929	Dredger "Madras." 1906. to 1929.
Quantity dredged	Tons	137,332	4,599,598
Working days—			
(*a*) Dredging	No.	*189½	4,580
(*b*) Other than dredging	,,	...	153
Sundays and holidays	,,	44	1,157
Days absent to overhaul and special repairs	,,	124½	1,615½
Days under repair and weather bound ...	,,	7	895½
Dredged per working day	Tons	725	1,004½
Rate per ton	Annas	16·1398	9·1037
Rate per ton including interest and depreciation	,,	21·1279	12·5310

*For maintenance 69¾.
,, other works 119¾.

POLICE AND MEDICAL.

The following is a summary of the reports received from the police and the medical authorities:—

(a) Police.—The value of the property stolen from the harbour premises has increased from Rs.555 to Rs.1,422 as compared with the previous year. The total number of cases reported during the year was 58, of which sixteen were thefts of articles above Rs.5 in value, nine petty thefts below Rs.5, and the rest were under other sections of the City Police Act, etc. This compares with 50, 11 and 10 cases respectively in the previous year.

(b) Medical.—Eight hundred and forty-eight vessels arrived here from different ports with crews numbering 73,338 and 106,459 passengers against 818 vessels with crews numbering 75,748 and 115,166 passengers during the previous year. 337 vessels with crews numbering 29,434 and 16,380 passengers were inspected and granted bills of health against 342 vessels with crews numbering 34,343 and 56,964 passengers in the previous year. There were two cases of chickenpox, one of smallpox and two cases of suspected cholera found among the passengers and crews of the steamers that entered the harbour during the year, and they were sent to the infectious diseases hospital for treatment. The disinfection of bedding and clothing of deck passengers and crews landing at, and embarking from, the port was continued in the disinfection shed in charge of a sub-assistant surgeon. A nurse is employed for the examination of female passengers. No unusual mortality of rats was reported on any of the vessels that entered and left the harbour during the year.

MUNICIPAL TAXATION.

The total amount paid to the Corporation by the Trust as taxation during the year 1928-29 amounted to Rs.2,15,846. In addition, Rs.42,164 was paid for 33,732,910 gallons of Corporation water for the Trust's use and Rs.98,644 for 24,663,295 gallons of water supplied to shipping at the respective rates of Rs.1—4—0 and Rs.4 per 1,000 gallons.

ASSOCIATION OF PACIFIC AND FAR EAST PORTS.

The officers of the Association of Pacific and Far East Ports for the year 1929-30, are as follows:—

M. A. Graham, President Board of Harbour Commissioners, San Diego, Calif; C. W. Orton, President, Port of Tacoma, Tacoma, Washington; Ralph T. Fisher, President, Board of Port Commissioners, Oakland, Calif; J. W. Brennan, Secretary, Board of Harbour Commissioners, San Diego, Calif; B. Geo. Hansuld, Commissioner, Vancouver Harbour Commission, Vancouver, B.C.; J. A. Eves, Commissioner, Port of Tacoma, Tacoma, Washington; P. H. Carroll, Secretary, Commission of Public Docks, Portland, Oregon; C. L. Tilden, President, Board of State Harbour Commissioners, San Francisco, Calif; Bert Edwards, General Manager, Board of Harbour Commissioners, Los Angeles, Calif; George F. Cotterill, Commissioner, Port of Seattle, Seattle, Washington; W. H. Peters, Manager and Chief Engineer, Port of Grays Harbour, Aberdeen, Washington; B. F. Stone, President, Port of Astoria, Astoria, Oregon; F. R. Browne, Manager, Port of Vancouver, Vancouver, Washington; Rufus Choate, Commissioner, Board of Harbour Commissioners, San Diego, Calif.

Notes of the Month.

BELFAST EXPORT RATE ON FLOUR REDUCED.

The Belfast Harbour Board has made the official announcement that the export rate on flour milled from wheat or corn imported through the Port of Belfast has been reduced from 8d. to 3d. per ton.

The export rate on grain products such as bran, meal and kindred articles milled from wheat or corn imported through the Port of Belfast will also be reduced 50 per cent. of their appropriate rates.

This reduction will be of benefit to millers, especially in the rural districts of Northern Ireland, and an encouragement to them to re-export their products through the Port of Belfast instead of through other channels of communication. Local millers may not be so much affected by it, for the export of flour is not a big trade. Returns from the harbour show that the export for the three months ended March, 1929, amounted to 897 tons, whilst for the period of 1928 it was 1,508 tons. The imports of flour for the quarter were 15,697 tons in 1929, and 20,000 tons in 1928. For the whole of 1928, 4,754 tons of flour were exported from Belfast, and in the same year the total imports of flour were 73,786 tons.

At a meeting of the Belfast Harbour Commissioners the Harbour Master (Captain McIntyre) presented his report, which showed that 329 vessels entered the port between the 19th and 31st August as follows: Coastwise and cross-Channel, 308; foreign, 20; non-trading, one. The total tonnage of the vessels which arrived from 1st January to the 31st August was: Coastwise and cross-Channel, 1,106,100, an increase of 165,207 over the corresponding period in 1928; foreign, 415,345, an increase of 13,743; non-trading, 50,844, an increase of 974; grand total: 1,572,289, an increase of 179,924.

BOMBAY PORT TRUST.

At a meeting of the trustees of the Port of Bombay held on August 27th, the following main items of business were disposed of:—

The following leases were granted:—

Two 99-year leases of plots Nos. 17 and 18 (area 800 sq. yards each) on the old Cotton Green at Colaba for erection of first-class residences.

A 99-year lease of plot No. 20 (area approximately 1,155 sq. yards), Dougall Road, Ballard Estate, to the Imperial Chemical Industries (India), Ltd., for erection of a four-storied building for offices and residences.

A 30-year renewal of lease at Surat Street, Elphinstone Estate, and a 50-year renewal of leases at the junction of Frere Road and Karwar Street, Mody Bay Estate, on terms agreed to by the lessees for shops and residences.

In connection with a reference from the Government of Bombay requesting the trustees' views on the report by Mr. C. W. Lloyd Jones, C.I.E., on facilities for Terminal Goods Traffic at Bombay, the Board considered and approved for submission to government a report drawn up by the three administrations concerned, viz., the G.I.P., and B.B. and C.I. Railways and the Bombay Port Trust, detailing their opinion on the proposals.

Representations having been received regarding thefts of goods lying at Malet Bunder owing to inadequate lighting sanction was accorded to the installation of electric lighting at and around the Bunder.

VICKERS, LIMITED.

British prestige in the field of engineering has still further asserted itself by the recent great achievements on land, on water and in the air. With these achievements Vickers, Ltd., have been closely identified, for Vickers steels were used in the production of vital parts of the engines of Sir Henry Segrave's " Golden Arrow " car, also in the Napier engine of his motor boat " Miss England," and in the Rolls-Royce engine of the Vickers S6 Supermarine seaplane. This seaplane, which retained for Great Britain the Schneider Trophy, 1929, was designed and constructed by the Supermarine Works, Southampton, the whole of the capital of which is held by Vickers (Aviation), Ltd. The new giant airship R.100, which will shortly leave its hangar at Howden, is also a Vickers product, for its construction has been financed by Vickers, Ltd., who own the whole of the cash capital of the Airship Guarantee Co., the constructors of the ship.

WATERFRONT INSURANCE RATES REDUCED.

As a result of the recent reduction of insurance rates on the New Orleans public wharves from Louisiana Avenue to the inner harbour navigation canal, the Louisiana Rating and Fire Prevention Bureau on September 4th issued a new rate schedule on commodities resting in those wharves during transit. The reduction varies at the several wharves, but is generally substantial, and is effective as from February 16th, 1929. The new rates, as published, are available to shippers through the Louisiana Rating and Fire Prevention Bureau.

KIEL CANAL TRAFFIC IN AUGUST, 1929.

A report received by the Department of Overseas Trade from His Majesty's Consul-General at Hamburg states that the volume of traffic through the Kiel Canal during the month of August, 1929, showed an improvement over the preceding month with a record of 5,882 vessels passing through the canal as against 5,612 in July. Of the 5,882 vessels, 2,820 were registered as sea-going steamers aggregating 2,335,940 net registered tons, and of these, 2,674 were cargo and passenger steamers aggregating 2,329,226 net registered tons, 140 tugs of 5,751 net registered tons and six fishing steamers of 513 net registered tons. There were also 2,419 sailing vessels of 125,410 net registered tons, 234 lighters and barges of 59,171 net registered tons, and 409 naval and service and pleasure vessels of 58,654 tons. The vessels were loaded as follows:—79 with passengers; 133 with stone; 277 with coal; 75 with iron; 68 with ore; 752 with timber; 642 with grain; 35 with cattle; 1,017 with goods in bulk; 999 with piece goods; 80 with mixed cargo; and 1,725 empty or in ballast.

Personal enquiries regarding shipping and transport matters should be made at the City office of the Department (Shipping and Transport Section), 73, Basinghall Street, London, E.C.2.

PROGRESS OF WORK ON THE KUSTEN CANAL.

The Department of Overseas Trade has received from His Majesty's Consul at Bremen a translation of a report on the Kusten Canal, which has recently been published, together with an explanatory map. This Canal is intended to connect the Lower Weser at Elsfleth with the Dortmund-Ems Canal, near Dorpen, and form a means of communication between the Ruhr district and the Lower Weser ports. It will have a width of 27 to 33 metres and a depth of 3.50 metres in the centre and locks of 12 metres width and will accommodate vessels of 750 tons.

The present route in use from the Ruhr to Bremen is via Mittelland Canal to Minden and thence up the Weser, the distance to Bremen being approximately 390 kilometres, while it is anticipated that via the Kusten Canal this distance would be only 327 kilometres.

It is hoped that upon completion of the Canal a certain amount of traffic will be diverted from Rhine ports to the Weser, and that Westphalian coal will to a considerable extent take the place of British coal now imported into the Lower Weser ports.

His Majesty's Consul states that work on the canal is proceeding slowly, but is nearing completion, with the exception of one stretch of about 8 to 10 kilometres in length from the Oldenburg frontier near Sedelsberg. This work has been held up owing to the necessary funds not being available and it is doubtful if operations will be commenced this year. The regulation and deepening of the River Hunte is now being considered by a committee composed of representatives of the German Ministry of Transport and Oldenburg State officials.

It is stated that important industrial concerns in the Rhenish and Westphalian districts have already acquired land near the Canal and at the present time about 25 peat works, 8 peat moss litter factories and a number of " Torfbrikett " works, etc., are situated on the banks.

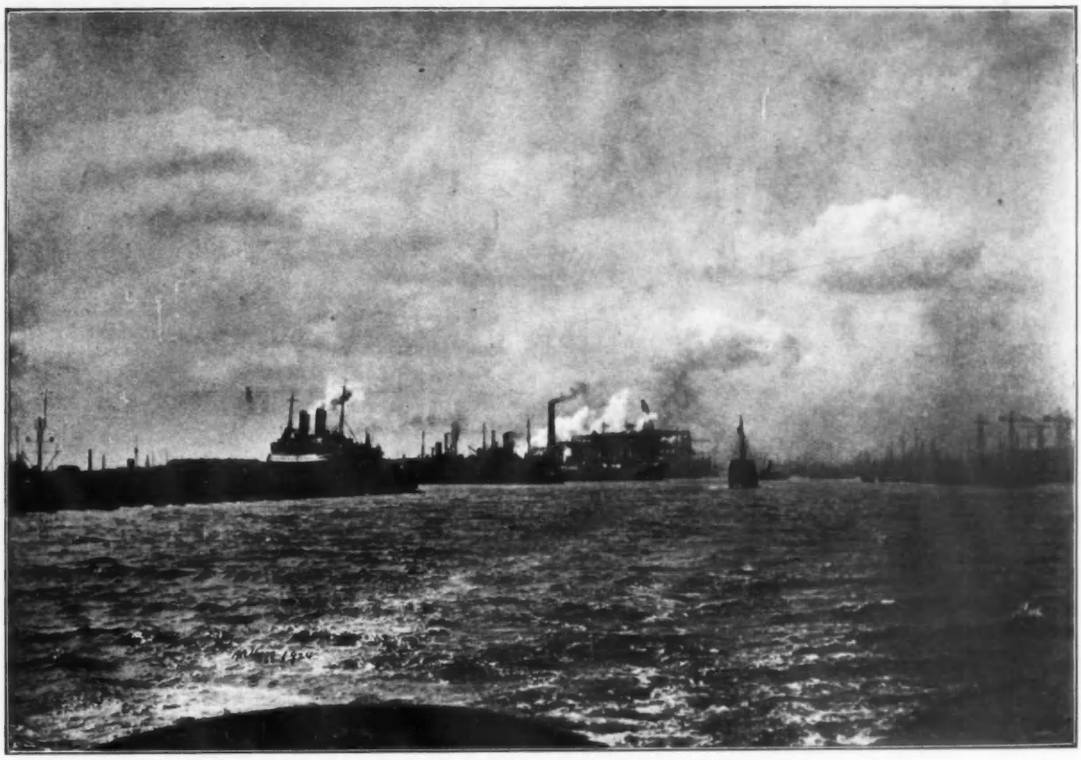
A full copy of the translation of the report, with map, may be consulted upon application to the City Office of the Department (Shipping and Transport Section), 73, Basinghall Street, London, E.C.2.

WESER SHIPPING IN AUGUST, 1929.

Due to the continuation of the unusual drought, the water conditions on the Weser were still lower in August. The average depth at the Minden water gauge fell from 1.85 metres in June to 1.76 in July and 1.71 in August, while corresponding figures of the Hameln water gauge were 1.47, 1.40 and 1.39 metres respectively. The increase is, therefore, unimportant in Hameln and also in Minden only slight. But this was only obtained from the water supply from the Edertal dam. It alone may be thanked for the fact that there has been a continual depth from Hanover Muenden of about one metre, making shipping traffic, if restricted and financially unfavourable, possible. However, the store of the Edertalsperre is now so small that only the water necessary for feeding the Mittellandkanal can be supplied. Thus shipping on the Weser above Minden, as may be foreseen, will come to a complete stoppage.

Traffic through the Bremen lock was 4,700 tons less. 183,700 tons, or 11,100 tons less than in July, went down the river. Coal transport increased from 51,000 tons to 59,100 tons, and thus did not reach the level of coal imported into the Weser ports from England (61,600). Gravel and stones increased by 7,200. Potash and salt decreased by 1,400 tons. Piece-goods and other commodities also showed a decrease. Up-river traffic with 46,800 tons remained 15,800 tons behind the previous month, especially as a result of falling off in grain shipments (9,600 tons). Timber transport was also less (1,800 tons). Flour increased by 1,600 tons.

The Port of Belfast.



The approach to Belfast Harbour showing Harland & Wolff's shipyard on the left and Workman Clark & Co's shipyard on the right.

Photo by A. R. Hogg, Belfast.

THE story of the Port of Belfast is also the story of the City of Belfast. Both have developed side by side; the port from a small place where ships met at irregular intervals to one of the world's greatest shipping and shipbuilding centres, the City from a town of the smallest importance to a municipality which holds high rank, not only in the United Kingdom, but in the far-flung British Empire. No matter where one goes, in the seas of every clime, the port of Belfast is known just as the industrial products of the City are known and recognised.

The transformation from the small place and the unimportant town was not accidental, but was brought about by the courage, ability, and far-sightedness, which have always been characteristics of the Belfastman. No opportunity for development on the right lines was missed. Difficulties there were in plenty, but these were taken as a matter of course and were surmounted. Quietly, almost unostentatiously the port was built up, each stone being well and truly laid, and it can be truly said that those responsible for the administration of the affairs of the Trust to-day are as much alive to the possibilities of the future as their predecessors, so that although the story of the port of Belfast is a long one and full of interest, the last chapter has not by any means been written.

The Belfast Harbour Act of 1785 established a body under the title of "The Corporation for Preserving and Improving the Port and Harbour of Belfast." The Corporation became known locally as the "Ballast Board" and it was empowered to supply vessels with ballast at the charge of 2s. per ton, with an addition of 1s. per ton for foreign vessels. Home ships, using the port, were required to pay dues at the rate of 2d. per ton, foreign ships 3d. and coasters and coalers 2d. less one-third. The Board had also authority to license pilots and appoint officers. The revenue was disbursed in a way that strikes the men of to-day as somewhat peculiar; but different times, different methods. Part of the income was applied to paying salaries (as necessary then as to-day), rewards, pilots and the necessary expenses of the Corporation. The balance was devoted to improving the harbour in order to make it more safe and convenient for vessels using it, building and erecting ballast wharfs, and wet and dry docks.

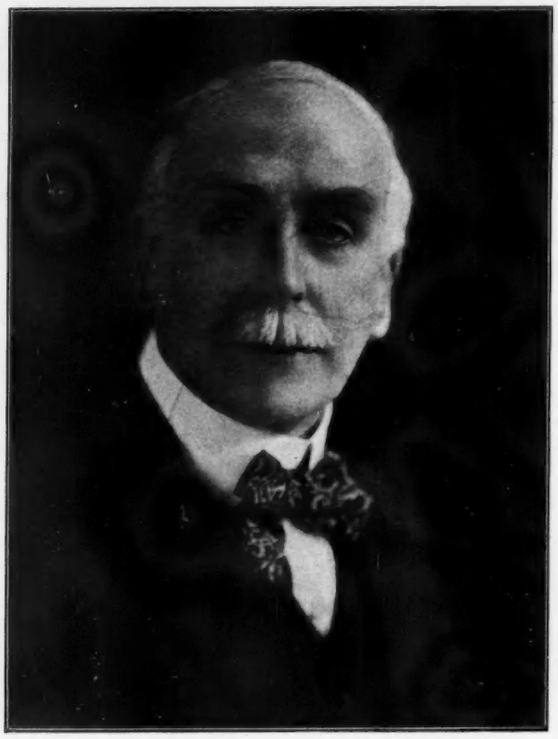
The surplus was handed over to the president and his assistants, for the time being, of the Belfast Charitable Society for the better support of the poorhouse or workhouse and infirmary for the town of Belfast. This was certainly a remarkable way to dispose of the surplus of an undertaking like the port, but it was none the less creditable to those responsible for the idea as it showed that they were not unmindful of the poor and sick of the town. To-day the Belfast Charitable Society is carrying on its good work, although in a different way, of looking after the aged and helpless.

The new Corporation displayed commendable enterprise from the outset of its career and proceeded to carry out its duties with energy and wisdom. The first of a long series of improvements was a new graving dock which cost £7,684 and was opened in 1800. It is still in use as the Clarendon Graving Dock No. 1, and was followed by the Clarendon Graving Dock No. 2, which was finished in 1826. The deepening of the harbour was, however, the most serious problem for the Board as at low water the tide ebbed entirely out of the River Lagan, which divides Co. Derry from Co. Antrim, and left a very narrow and crooked channel of a depth of from 2-ft. to 4½-ft. in front of the town.

In 1821 a scheme was prepared by Mr. John Rennie (afterwards Sir John Rennie), the eminent engineer, to cost £250,000; but the Government refused all financial help and so the project fell through, as of course the expenditure of such a vast sum at that time by the Corporation was out of the question. There was a long interval, as it was not until 1830 that a definite step was taken. Mr. John Walker, of the firm of Walker and Burgess, was entrusted with the task of preparing another scheme. He produced one to cost from £180,000 to £200,000. The main feature of the scheme was the formation of two cuts or channels across the bend of the river between the town and Garmoyle (a point near the mouth of Belfast Lough, almost opposite Carrickfergus and approximately 8 miles from the town), thus making one long straight channel. He also suggested the deepening of the river to 12-ft. at the harbour and the building of new quays.

The scheme met with general approval and another Bill was promoted in Parliament to give the Corporation or Board the required authority. There was some opposition from vested interests, but eventually the Bill became an Act in August, 1831, under the title of "An Act for the Better Improvement of the Port and Harbour of Belfast in Ireland and for other purposes." The Act also constituted a new Board with the old title. Application was made to the Board of Public Works for a loan of £60,000 to enable the scheme to be carried into effect. There was, however, another long delay and it was several years later before the work was started. The Board subsequently obtained the right and title to portion of the river bed between the town and Garmoyle, 885 acres in all, and then applied to the Treasury for a loan to carry out the necessary improvements. More difficulties obtruded themselves, but in

1837 still another Act was passed empowering the Board to make the channel, the Board being again reconstituted with a membership of 18. The Treasury granted a sum of £25,000 for the work, but declined a further request made the following year for a loan of £210,000. The Board, however, rose to the occasion and taking its courage in both hands decided to



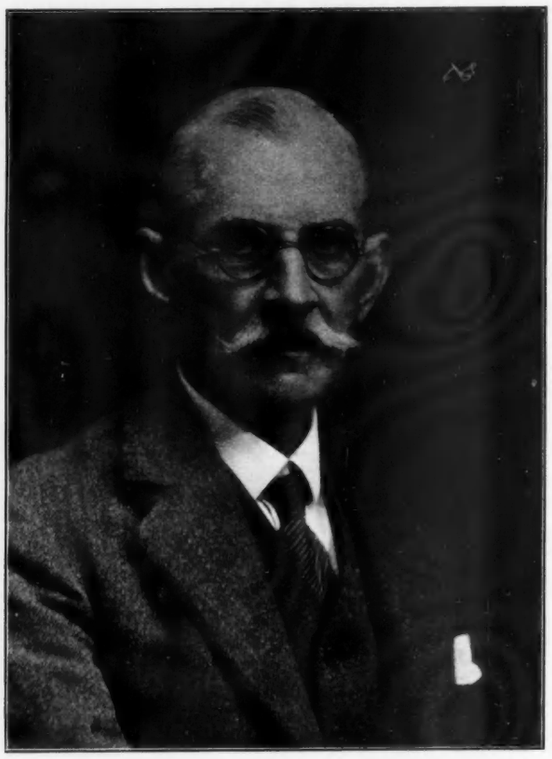
R. E. Herdman, D.L., J.P., Chairman, Belfast Harbour Commissioners.
Photo by C. H. Halliday, Belfast.

borrow from the public by the issue of Bonds. In this way plenty of money was forthcoming and in 1841 the first channel was finished at a cost of £42,352, while at the same time the river was deepened at an expenditure of £5,000. Four years

M. J. Watkins, General Manager and Secretary, Belfast Harbour Commissioners.
Photo by C. H. Halliday, Belfast.

later the " Ballast Board " put the coping stone on its great work by the purchase of all the quays and shipbuilding yards belonging to private individuals on both sides of the river, the cost being £134,500.

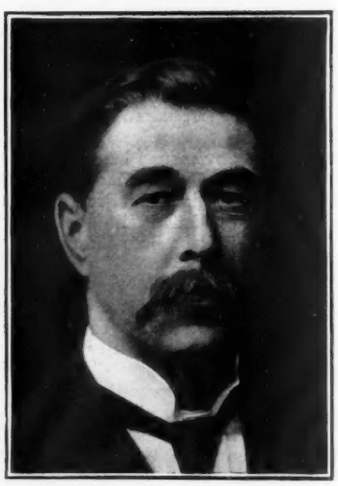
The way was now clear for the development of the port to what it is to-day. Parliament fully recognised this fact by passing the Belfast Harbour Act, 1847, which constituted the Belfast Harbour Commissioners for the control of the Port of Belfast. With some minor modifications, as regards its constitution made by later Acts of Parliament, the Commissioners remain to-day the port authority and it can be truly



T. S. Gilbert, B.E., M.Inst.C.E., Engineer, Belfast Harbour Commissioners.
Photo by C. H. Halliday, Belfast.

said that each successive Board has left its mark in improvements and extensions. From the day the Commissioners assumed office the port has never looked back, but has developed stage by stage, usually in line with the ports of Great Britain, sometimes in front of them, but never a yard behind them.

Year after year the area of the estate under the jurisdiction of the Commissioners was extended, at one time on the County Down side of the river, at another the Co. Antrim side, while new wharfs were built and the quays extended to meet the rapidly-growing traffic. The Commissioners had not only to meet the fresh demand for shipping facilities, but also to keep in step with the development of the shipbuilding industry and provide facilities for the finishing and docking of the great liners turned out from the two yards; Messrs. Harland and



Captain J. McINTYRE,
Harbour Master at Belfast.

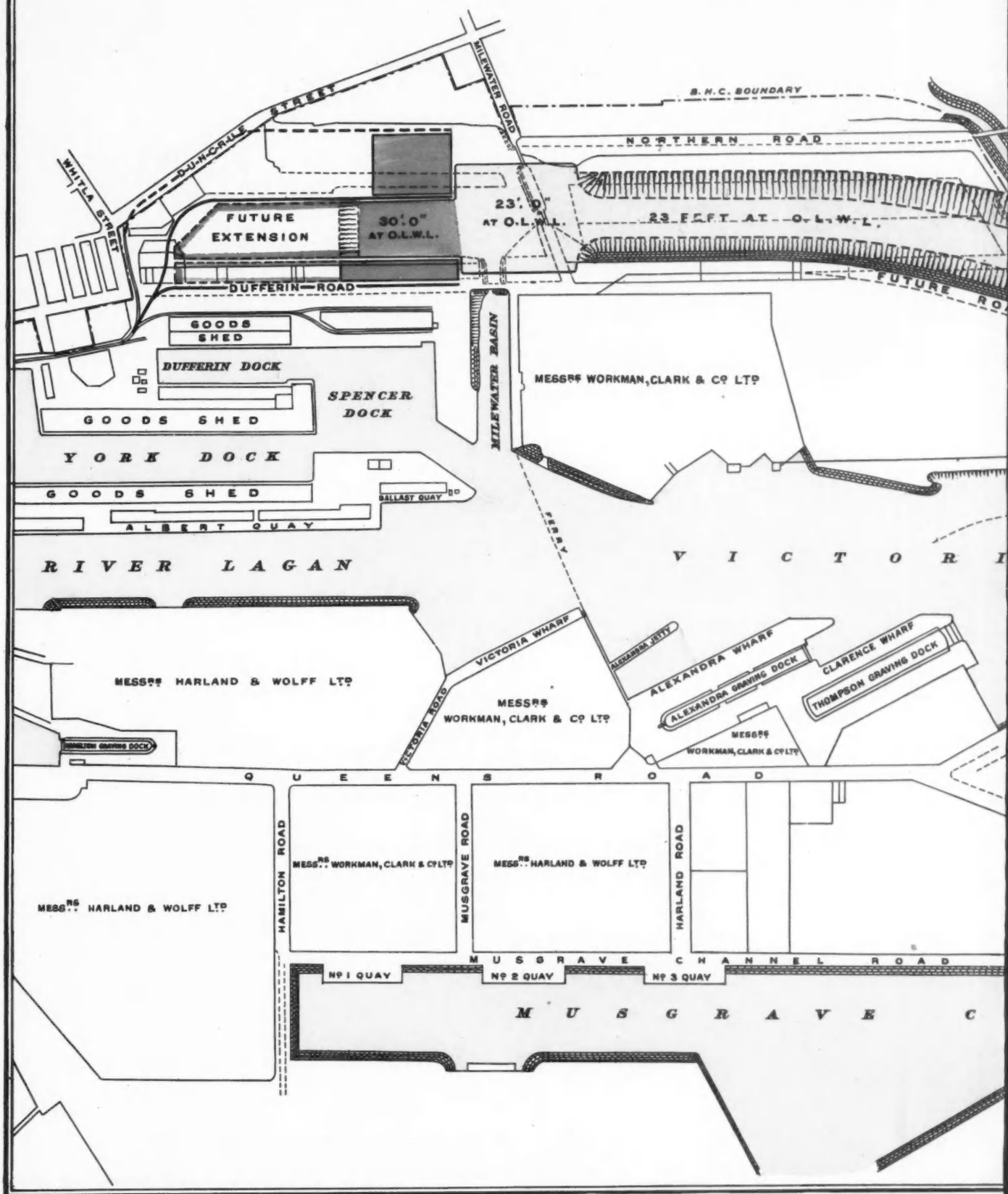
Wolff's, and Messrs. Workman Clark and Company's. This double feat was, however, accomplished with the result that the builders were able to complete every vessel for her trial trip, an enormous advantage to the industry of the City.

In 1864 after many improvements and extensions, another big step forward was taken in the construction of a new

BELFAST HARBOU

(SCHEME FOR NEW DOCK)

UNDER THE JURISDICTION OF THE BELFAST HARBOUR COMMISSIONERS.



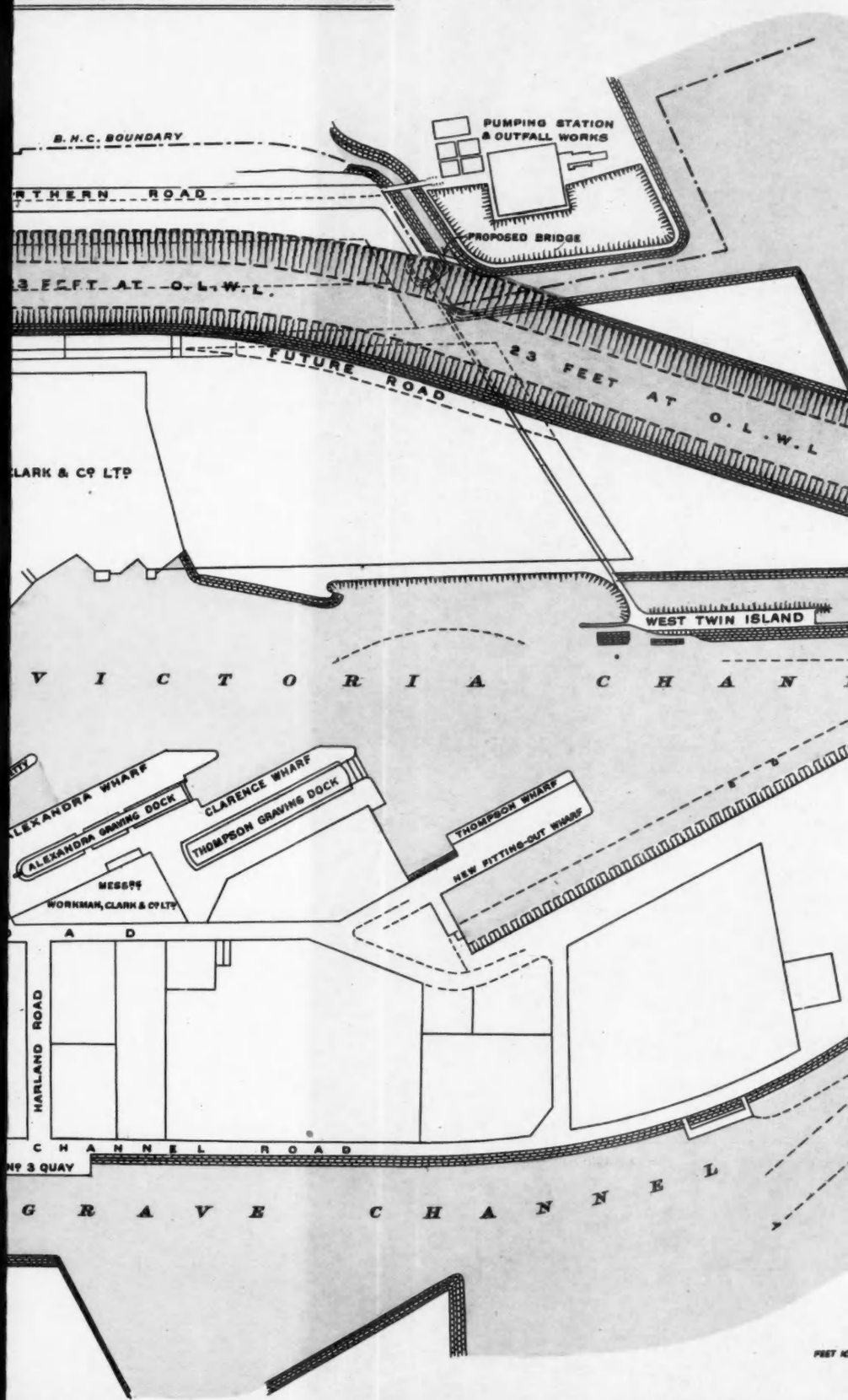
WARD & FOXLOW. Harcou

THE DOCK AND HARBOUR AUTHORITY,

HARBOUR.

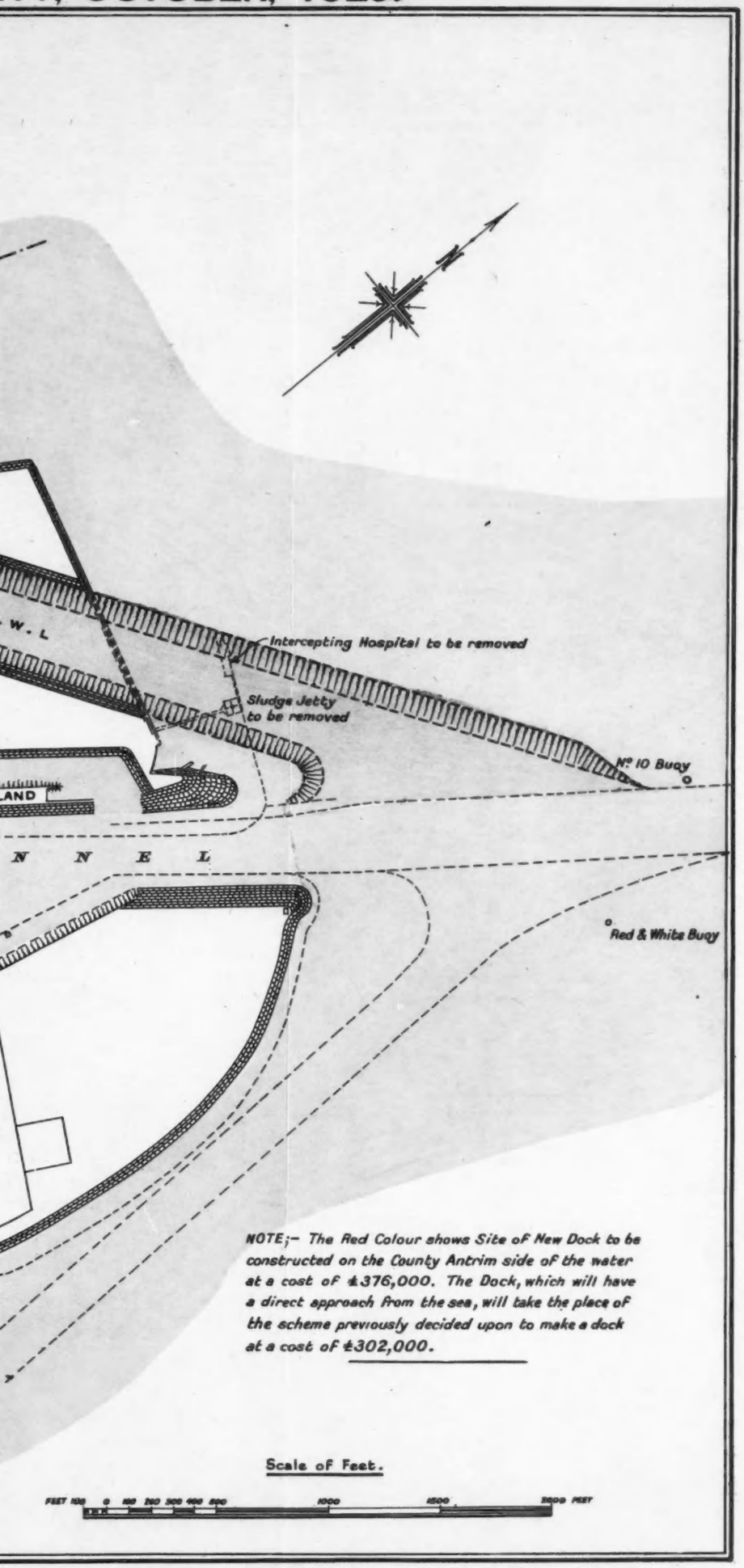
NEW DOCK)

ST HARBOUR COMMISSIONERS.



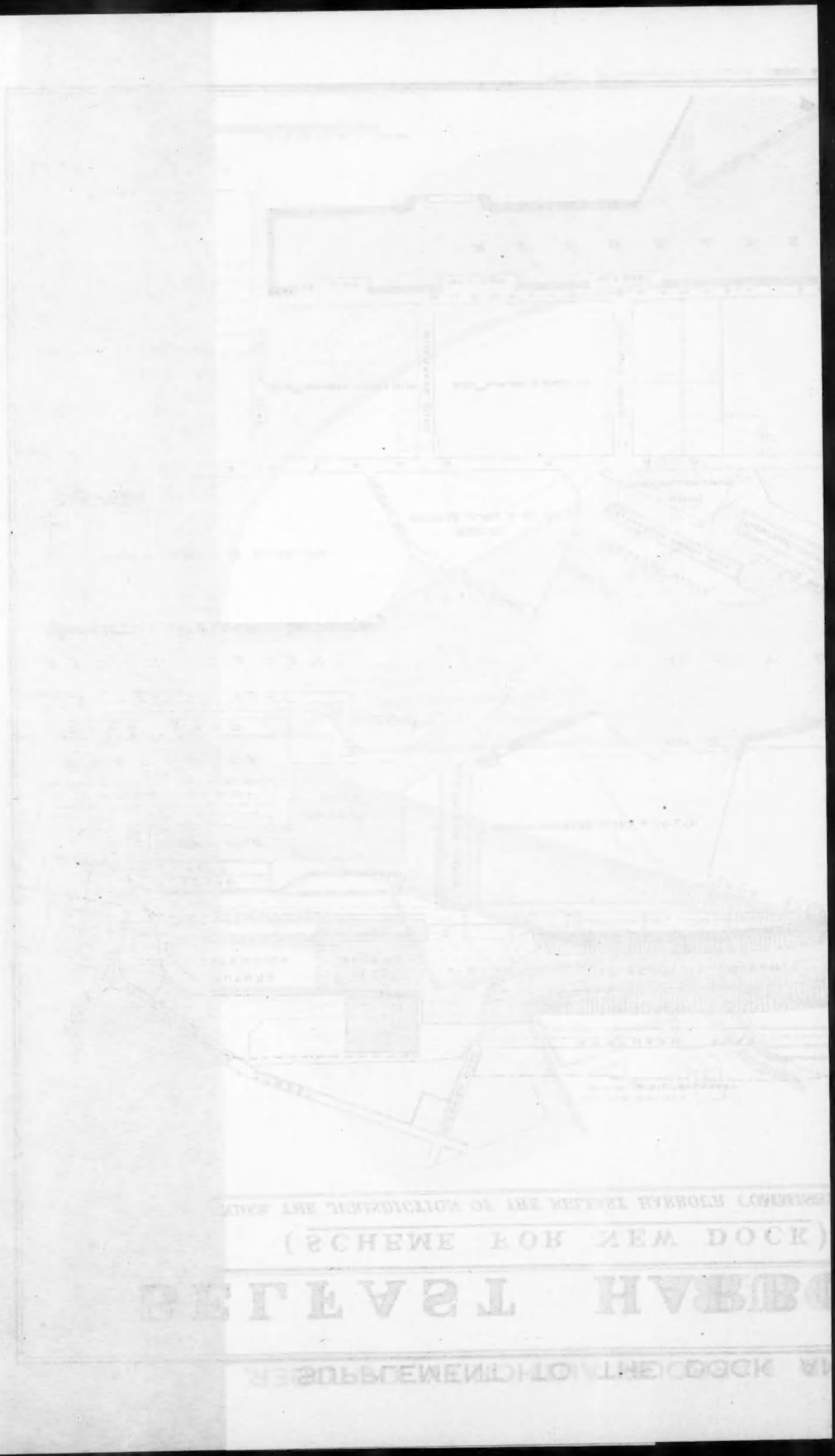
WARD & FOXLOW. Harcourt St. Marylebone. W.1. 5418.

ITY, OCTOBER, 1929.

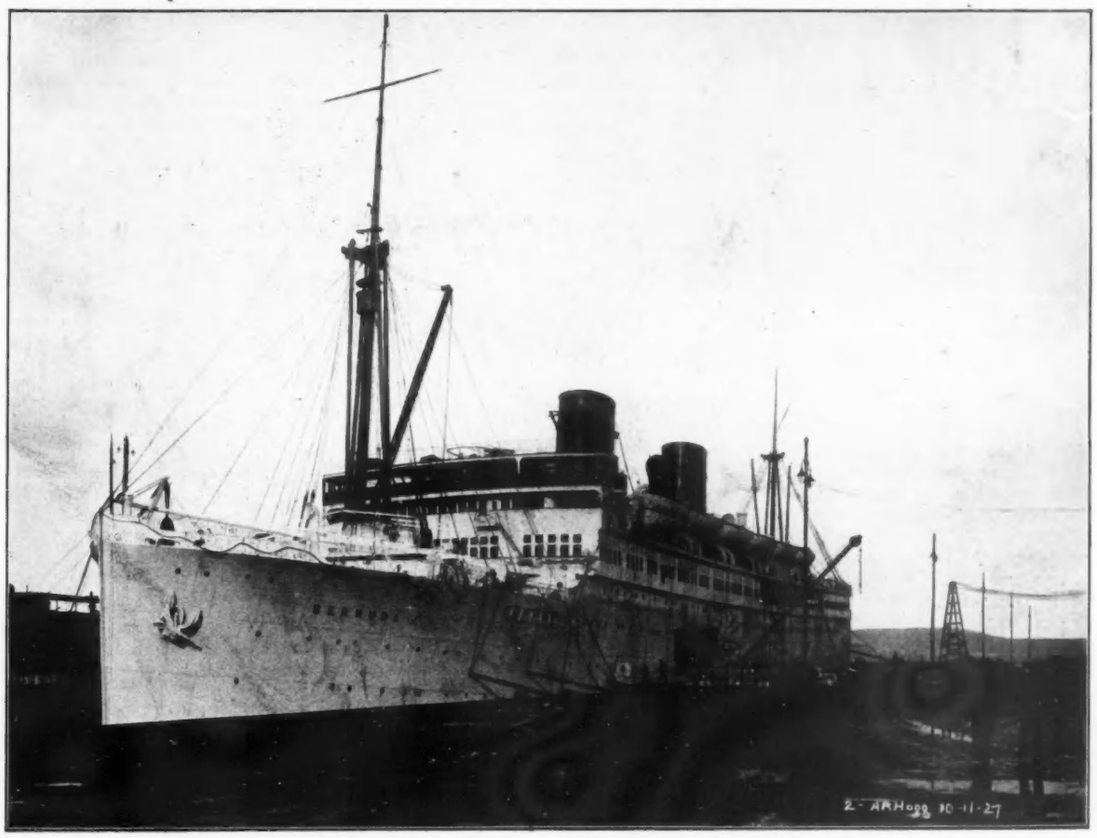


NOTE;- The Red Colour shows Site of New Dock to be constructed on the County Antrim side of the water at a cost of £376,000. The Dock, which will have a direct approach from the sea, will take the place of the scheme previously decided upon to make a dock at a cost of £302,000.

Scale of Feet.

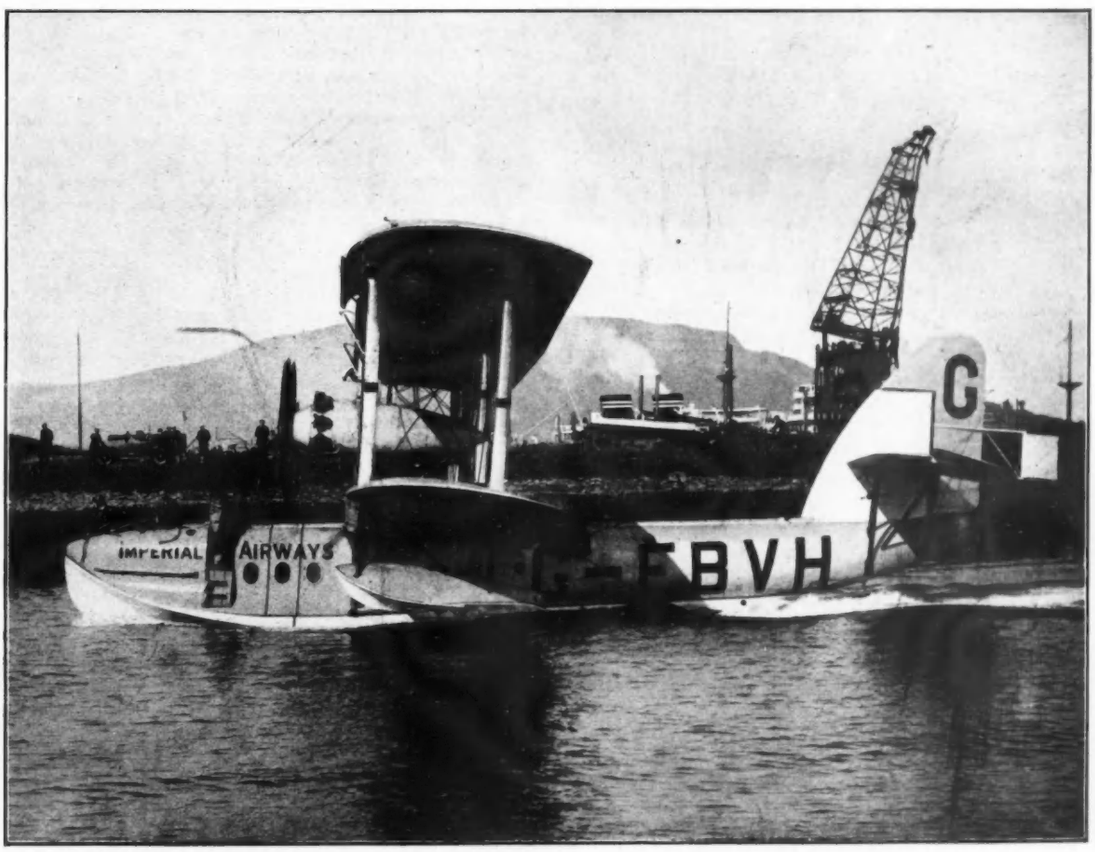


The Port of Belfast.



S.S. "Bermuda" in Thompson Dry Dock, Belfast Harbour.

Photo by A. R. Hogg, Belfast.



The Calcutta Flying Boat at landing stage in Belfast Harbour.

Photo by "Northern Whig," Belfast.

York Dock.

graving dock and tidal basin on the Co. Down side of the river, both being opened in 1867. Immediately afterwards a start was made with the construction of floating and tidal docks on the Co. Antrim side and these were used for the first time in 1872. During the succeeding years the channel of the river was again widened and deepened. The Albert Quay was re-renewed and extended, the Queen's Quay reconstructed and the Donegall Quay rebuilt with extensive new goods sheds. The number of graving docks was also added to by one larger than any in existence, while a further extension of the channel—named after Queen Victoria—was carried out.

But there was no end to the enterprise of the Commissioners. The traffic at the port was increasing by leaps and bounds and the cry was more space and still more space with additional facilities. The Commissioners, therefore, decided to construct the large dock on the Co. Antrim side and this was opened in 1897 by the Duke and Duchess of York (King George and Queen Mary) by whom it was named the York Dock. The attention of the Commissioners was later directed to the Co. Down side of the river where the Musgrave Channel (called

Thompson Graving Dock, Belfast.

after the chairman of that day) was constructed and completed in 1903. The channel was furnished with a number of quays and cranes and formed a large tidal dock capable of accommodating vessels of considerable size. Almost immediately afterwards the Commissioners decided on the boldest step in the history of the Trust. This was the construction of a new graving dock on the Co. Down side larger than any ever contemplated at that time in any country. The necessity for the new dock came when the keel was laid at Harland and Wolff's shipyard of the "Olympic," the first of the three great liners ordered by the White Star Company. The undertaking was a big one and might well have made the Commissioners pause. But with magnificent courage they decided to go ahead and the dock which cost £900,000 was opened in 1911 and named the Thompson Dock out of compliment to the Chairman of the Commissioners at that date.

Without scarcely a pause the Commissioners proceeded to further deepen the Victoria Channel, construct a large number of new sheds, and build deep water wharves. The port has always been noted for its up-to-date appliances. There are now to be found on every part of the extensive estate quayside cranes ranging in capacity from 2 to 10 tons for ordinary loading and discharging, with special cranes for heavy lifts up to 120 tons. Apart from these there are plenty of moveable cranes, capable of dealing with loads up to two tons for the rapid handling of goods in the sheds. In order to meet the demands of the fine new service of motor vessels, started by the Belfast Steamship Co. between Liverpool and Belfast, the Commissioners provided three electric transporter cranes of the most modern type at the Donegall Quay for handling the varied cargoes carried by the vessels in both directions.

With the development of oil for commercial and navigational purposes there came the request for up-to-date facilities for dealing with this special kind of traffic and the Commissioners more than met the demand by constructing a deep water berth 500-ft. long, where the largest tankers can discharge their bulk cargoes through pipelines and oil-burning vessels can be supplied expeditiously with fuel. The principal companies engaged in the trade did their share by laying down in the vicinity of the berth large installations for storing and supplying oil, petroleum, petrol, etc., with the result that Belfast can now claim without fear of challenge, to be the largest distributing centre for these commodities in Ireland.

The latest enterprise of the Commissioners is the construction of a new dock on the Co. Antrim side of the river. The dock, which will be constructed on the site of the present timber ponds, will, it is estimated, cost £376,000 and when completed will increase the facilities of the port by deep water quays, 2,040-ft. long, which will be equipped with the most modern type of tramways, sheds and appliances. Perhaps the outstanding feature of the new scheme, however, will be the construction of a channel connecting the dock directly with the sea, through the main channel, thus making the approach of the safest and quickest; no mean advantage in these days when, in shipping affairs, as in other businesses, time is money. When the dock is completed the Commissioners will be able to congratulate themselves on controlling a port where the facilities for ships and shipbuilders are second to none.

Another phase of the activities of the port has been developed during the past few years; the transatlantic passenger traffic. Now several of the principal companies engaged in this important traffic have regular sailings from the port and only recently four of the great liners called during one week-end. The Commissioners made special arrangements for dealing with this traffic and erected a jetty, with a shed containing waiting room, and accommodation for customs examinations, medical inspections, etc., the whole being described by seasoned travellers as admirable in every way and a credit to Belfast. The jetty is situated at the south end of Queen's Quay, a quarter-of-a-mile from the centre of the City, a couple of hundred yards from the Co. Down railway terminus, and about a mile from the Midland Railway, which serves the whole of the North of Ireland, and the Great Northern Railway which connects up with the whole of the South.

In the near future a great port, such as Belfast is, will lack something essential to modern transport requirements if it does not possess an aerodrome. The port, however, will have its aerodrome which will be situated on the harbour estate. The promoters of the scheme are the Flying Services, Ltd., and they have received every encouragement from the Commissioners who agreed to spend £6,000 in laying out the ground, making a new road and constructing a fence. The negotiations are nearing completion and it is expected that a start will be made with the work of construction in the near future.

The port of Belfast has to-day the distinction of being the chief port in the whole of Ireland as well as one of the most important of British ports. The distinction, which naturally is a source of pride to the people of the City, was won by a combination of capacity, understanding and enterprise, all wisely directed in developing the natural advantages of the port's geographical situation. It stands at the head of Belfast Lough, an inlet of the sea, about 12 miles long, and is a splendid ocean terminal and distributing centre, possessing, as it does, all the advantages of the seaport, with many of those to be found in an inland port. Moreover the Lough gives ships the advantage of getting so much nearer the point of origin or destination of cargo, so that the cost of transport is

Donegall Quay.

reduced. In addition to this the tidal range at the harbour is only 9½-ft. at its maximum, so that dock gates are not required and vessels are able to get to their berths at all times, so that the tedious delays at ports, where vessels have to wait for high water to dock, are avoided.

There are no less than six miles of quays at the port, affording berths for vessels drawing up to 30-ft. at low water, and 12 miles of railway lines and sidings, by means of which direct connection is maintained with all the railway systems throughout Ireland. The Lagan Canal also provides an excellent way for the conveyance of goods between the port and the inland towns by means of lighters. There is plenty of accommodation for storing coal, ore, iron, steel, etc., while the facilities for keeping timber on land or in ponds are of the best. The Commissioners have from time to time carried out extensive

Harbour Office.

schemes of reclamation so that at the present time there are large tracts of ground adjacent to the water and railways suitable for additional works.

No better indication of the trade of the port could be given than the figures given below. It is to be noted that the total figures for the first six months of the present year record increases of 158,923 tons, vessels arrived and cleared, and 85,429 tons, goods imported and exported, over the figures for the corresponding period of last year.

TONNAGE OF VESSELS (NET REGISTER).

Year	Arrived	Cleared	Total
1920	2,654,107	2,693,893	5,348,000
1921	2,550,586	2,614,784	5,165,370
1922	2,798,868	2,855,538	5,654,406
1923	3,016,687	3,049,649	6,066,336
1924	3,164,274	3,253,839	6,418,113
1925	3,016,209	3,071,764	6,087,973
1926	2,666,607	2,775,478	5,442,085
1927	3,050,297	3,121,739	6,172,036
1928	3,023,245	3,070,986	6,094,231
1929 (6 months) ...	1,534,259	1,576,314	3,110,573

TONNAGE OF GOODS IMPORTED AND EXPORTED.

Year	Imported	Exported	Total
1920	2,742,864	624,612	3,367,476
1921	1,955,800	435,445	2,391,245
1922	2,208,541	467,937	2,676,478
1923	2,472,168	523,725	2,995,893
1924	2,794,080	525,308	3,319,388
1925	2,560,821	463,290	3,024,111
1926	2,261,500	452,675	2,714,184
1927	2,783,715	523,716	3,307,431
1928	2,623,596	514,323	3,137,919
1929 (6 months) ...	1,381,179	277,369	1,658,548

The undermentioned figures deal with the principal imports during the year 1928:—

Acid, 1,115 tons; ale and beer, 3,455 tons; apples and pears, 7,114 tons; asphalt, 8,545 tons; biscuits, 3,524 tons; boards, planed, 17,194 loads; boards, wood pulp, 2,262 tons; bottles, 6,669 tons; bran, 12,618 tons; bricks, fireclay and facing, 5,839 tons; bricks, bath, 36 tons; bricks, building, 5,798 tons; butter, 2,223 tons; motor carriages, 4,896; cement, 38,602 tons.

Coal, 252,087 tons; confectionery, 6,826 tons; cottons, 16,952 tons; feeding meal, 23,390 tons; flax, 14,588 tons; flour, 73,786 tons; hardware, 6,556 tons; hemp, 12,016 tons; Indian corn, 255,216 tons; iron bolts, 3,207 tons; pig iron, 10,413 tons; iron and steel castings, 16,192 tons; iron and steep hoop, 450 tons; iron and steel sheet and plate, 54,719 tons; iron and steel wrought and bar, 53,978 tons.

Linseed cake, 6,433 tons; machinery and machines, 10,432 tons; motor spirit, 48,284 tons; fuel oil, 25,690 tons; paraffin and petroleum oil, 17,042 tons; paper, 16,095 tons; phosphate rock, 13,190 tons; drain pipes, 332 tons; sewer pipes, 2,769 tons; preserves, 4,538 tons; pyrites, 7,113 tons; railway sleepers, 4,388 loads; salt, 3,896 tons; slates, 8,161 tons; soap, 3,904 tons; soda, 6,282 tons; soda, ash, 3,981 tons; sugar, 31,089 tons; tar, 5,621 tons; tea, 5,173 tons.

Tiles, 5,099 tons; timber, 44,422 loads; wrought timber, 2,989 loads; waste, flax hemp and tow, 2,183 tons, wheat 67,917 tons; woollens, 2,081 tons; yarn, linen, 3,727 tons; yarn, cotton, 3,543 tons.

The principal exports for the same year were:—

Aerated waters, 5,357 tons; bacon, 8,065 tons; butter, 1,588 tons; cattle, 109,842 head, white clay, 5,159 tons; new cordage, 8,505 tons; cottons, 11,774 tons; eggs, 17,325 tons; feeding meal, 5,098 tons; felt, 7,776 tons; flax, 1,502 tons; flour, 4,754 tons; fowl, 4,686 tons; hams, 3,560 tons; hay, 3,322 tons; hides and skins, 3,226 tons; horses, 2,142 head; Indian corn, 29,202 tons; scrap iron and steel, 28,235 tons.

Linen, 33,264 tons; machinery and machines, 15,780 tons; meal, 2,298 tons; oats, 1,016 tons; paper, 8,262 tons; pigs, 5,910 head; pork, 3,270 tons; potatoes, 127,894 tons; moulding sand, 3,948 tons; grass seed, 15,194 tons; sheep and lambs, 66,473 head; show cards, 1,295 tons; thread, 2,204 tons; timber, 1,985 loads; wrought timber, 203 loads; manufactured tobacco, 3,033 tons; waste, flax, hemp and tow, 9,092 tons; wheat, 9,060 tons; whiskey, 4,263 tons; linen yarn, 4,593 tons; yeast, 2,943 tons; motor carriages, 1,988.

As already indicated the Commissioners were called upon to provide facilities for the completion and docking of new vessels built in the shipyards, and in doing so they exhibited the same enterprise and foresight as raised the port to the position it occupies to-day. The relations between the Commissioners and the two shipbuilding firms have always been of the most cordial nature, each fully realising how much the prosperity and progress of the port depended upon the other. The following figures show the new tonnage constructed and cleared, every vessel being ready for service before leaving the port:—

Year	No. of Ships	Tonnage Net	Tonnage Gross
1920	26	69,078	108,551
1921	18	71,021	119,654
1922	13	75,130	126,522
1923	10	76,699	127,506
1924	12	54,478	88,978
1925	10	23,408	39,598
1926	8	50,024	82,864
1927	18	74,210	127,390
1928	16	53,372	90,482
1929 (6 months)	6	25,678	42,488

Throughout the long career of the Trust it has been exceedingly fortunate in having at its command as Commissioners many of the ablest professional and business men and captains of industry in Belfast. This explains the wonderful and uninterrupted progress made by the port in every direction and it is a truism to say that the present Commissioners are worthy successors of those who have gone before and that under their rule the motto of the port will be summed up in one word—"Advance."

The Commissioners have been backed up by a staff of very able, conscientious and courteous officials, who have succeeded at all times in performing the dual task of safeguarding the interests of the Trust and at the same time keeping on the best possible terms with those who use the facilities of the port on shore or water.

JOINT RAIL-AND-WATER RATES THROUGH NEW ORLEANS TO MEXICO EFFECT LARGE SAVING FOR SHIPPERS.

Joint rail-and-water rates from points north of the Ohio and east of the Mississippi to destinations in Mexico through the Port of New Orleans have been announced, effective September 10th, 1929. Participating in these rates, under which merchandise will move on through export bill of lading, are the Cuyamel Steamship Company, Standard Fruit and Steamship Company, the Mexican Railway, the National Railways of Mexico, United States rail lines serving the upper valley, the Mississippi-Warrior Service, and the American Barge Line.

The new rates apply from points of origin in the states of Ohio, Indiana, Illinois, Michigan and Wisconsin and from St. Louis, Minneapolis and St. Paul. Schedules of comparative rates are being prepared by the New Orleans Joint Traffic Bureau and will be distributed throughout the applicable territory. According to the bureau the new first-class through rate from Chicago to Mexico City via New Orleans will be $1.04 lower per 100 pounds than the present divided rail and water rates, and 45 cents. lower than the all-rail rate.

North-East Coast Notes.

Commercial developments on the North-East Coast are the most hopeful features of the moment. Not that anything spectacular is under way, but on all sides steady improvement is observable. One such that may be noted is the erection by the Pelaw Main Coal Company of a new staith at Pelaw Main on the Tyne, which embraces a new idea in coal teeming. The coals are tipped from the trucks into a hopper, from there they are carried by a rubber conveyor belt to the spouts. The end of the staith that carries the spout is on sheerlegs resting on bogie wheels, with a track on the quayside practically the full length of an ordinary collier. With the older staith, when one hold is full the ship has to be moved along to enable the next compartment to be filled. With self-trimmers this generally means from four to five moves. A considerable amount of time will thus be saved in loading operations, seeing that it will not be necessary to move the ship, the spout being moved instead. It is also stated that the rubber conveyor will reduce the percentage of small coal that accrues as a result of the present system of teeming. The staith is expected to be completed very shortly.

JARROW SLAKE SCHEME.

The question of the future of Jarrow slake is once more to the fore, this time in connection with the Government's scheme for alleviating unemployment. The Tyne Improvement Commission have had in view a large scheme for utilising the slake, or part of it, and to that end borings have been taken, and it may be that these plans will be greatly expedited if such assistance is forthcoming.

At the same time it is to be noted that the facilities for loading and discharging of vessels that visit the Tyne are already coping with a very large amount of trade. But there is, at the same time, every likelihood that more facilities would attract more trade. Any expansion of trade must raise immediately the question of providing more accommodation, and in this respect Jarrow Slake is considered to offer the best prospects of development. It is regarded as unlikely that the Slake would be made into a dock, but rather that deep-water staiths would be constructed with the most modern facilities for loading coal and coke and discharging ore cargoes.

TYNE'S LATEST GRAVING DOCK.

Messrs. Smith's Dock Company's new graving dock at North Shields is practically completed and will probably be in commission when these lines are printed. The reason for the construction of the dock was to provide more accommodation for oil tankers, repair work on which is steadily increasing, as well as to meet the steadily increasing size of cargo vessels. With the new dock completed the firm will be in the unique position of having three up-to-date dry docks side by side capable of accommodating all the largest oil tankers afloat, and a smaller dry dock and two pontoons.

The completed dock is 480-ft. long, 68-ft. wide at the entrance, and 83-ft. wide across, and has a depth of 24-ft. on sill at high water O.S.T. The new dock will replace the old No. 5 dock, and that portion of the latter which has not been taken in during the construction work is being roofed over at yard level with reinforced concrete to be utilised as an underground boiler-house and compressor house, and also as oil fuel storage tanks of about 4,000 tons capacity. This installation of oil tanks will prove of immense advantage for the purpose of storing the oil fuel bunkers from oil tankers and cargo vessels undergoing repairs in the dry docks.

TELEPHONE TO SHIPS.

Arrangements have been made between the Tyne Improvement Commission and the Post Office authorities for direct telephone wires to be laid from the North Shields telephone exchange to each of the five Whitehill Points staiths and the two coaling berths at the Albert Edward Dock. Each berth will have a separate telephone number, making it possible for subscribers to ring up any vessel berthed at the staiths at any time during the day or night. Portable instruments with the necessary length of cable will be provided and placed on board any vessel requiring the use of the telephone on her arrival at the staith, the portable telephone connection being removed immediately before the vessel leaves the berth.

It is reported that the property known as Graythorpes on the Tees has been purchased from Sir William Gray and Co., of West Hartlepool, by the Synthetic and Nitrates Company of Billingham. It is stated that the deal involves the acquisition of land and harbour rights with an existing wharf which, when equipped with loading and discharging installation, will enable the Synthetic and Nitrates Company to transport material and the produce of their works quickly and cheaply by steamer. The Synthetic Company belongs to the Imperial Chemical Industries, Ltd., and the works at Billingham employ more than 10,000 persons. Sir William Gray and Company retain the shipyard, docks, and model village at Graythorpes.

NORWEGIAN VISITORS.

A distinguished party of Norwegian commercial men have just recently visited Tyneside. They were representative of the Norwegian Committee of Communications and other Government dignitaries, and were entertained by the Civic authorities of Newcastle and the heads of the Tyne Improvement Commission. The party made a tour of the River Tyne and visited the new riverside quay at Albert Edward Dock. At luncheon there were speeches, and Mr. H. P. Everett, who presided, said the results of the first year's work of the Norwegian service from the new quay were known, and they had excelled all that the Bergenske Company or the Tyne Improvement Commission had expected, and he believed that the trade would further expand as the years went on.

Mr. F. Oftedal, Norwegian Minister of Commerce, replying, said the Tyne Improvement Commission, through foresight and imagination, coupled with a British practicability, had solved a great and difficult problem. "We Norwegians," he said, "have a special reason on this occasion to appreciate and value the importance of the Commissioners' enterprise. We know that the new quay at the Albert Dock has already been of great benefit to the trade and intercourse between Great Britain and Norway. It is the purpose of this visit to accelerate this development."

A notable reduction in import of pig iron and steel was reported at a meeting of the Tees Conservancy Commissioners in September. The total import in August amounted to 14,272 tons, against 21,944 tons in July, and 18,053 tons in August last year. For the past ten months the imports of all materials reached 155,832 tons, a substantial reduction on 191,954 in the corresponding period a year ago, but still greatly in excess of the 53,399 tons which was imported in the comparable period immediately before the war.

PERSONALIA.

Death has removed two well-known personalities in the North. Mr. Joseph Dunn, of North Shields, died at the end of August. For some years he had been managing director of Messrs. Clellands Slipway and Engineering Company at Willington-on-Tyne, and prior to that was manager of Blyth Shipbuilding and Dry Dock Company.

A Newcastle quaysider passed away in the person of Mr. J P. Blenkinsop, local manager for Messrs. Pyman, Watson and Company, of Cardiff and Newcastle. Formerly he was in the service of Messrs. George Pyman and Company, West Hartlepool.

The Junior Institution of Engineers.

Sir Ernest William Moir, Bt., M.Inst.C.E., has accepted the invitation of the Council to become President of the Institution in succession to Lieut.-Colonel J. T. C. Moore-Brabazon, M.C. His induction will take place at a meeting to be held at the Royal Society of Arts on Friday, December 13th, next, when he will deliver a presidential address.

The winter session of the Institution opens on October 4th, 1929, with a meeting which will be held at 7.30 p.m. in the Lecture Room of the Institution at 39, Victoria Street, when a paper entitled "Engineering Experiences on a Tea Estate in Assam" will be read by Mr. C. J. Hill (Member).

Thereafter meetings will be held weekly as stated, the programmes arranged for the first two months of the session being as follows:—

October.

11th.—Ordinary meeting. Paper, "Coal and Coal Cleaning," by R. H. Allen, B.Sc. (Member).

18th.—Informal meeting. Lecture, "Some Recent French Railway Construction," by W. A. Willox.

25th.—Ordinary meeting. Paper, "Electric Welding as Applied to Bridges and other Structures on the L.N.E. Railway, with Data as to Strength and Cost," by Harold Bruff (Member).

November.

1st.—Technical film, "The Age of Speed," Alfred Herbert, Ltd.

8th.—Annual General Meeting.

15th.—Informal meeting. Lecture, "Nickel and its Uses in Engineering," by W. T. Griffiths.

22nd.—Ordinary meeting. Paper, "The Quick-Running Oil Engine Applied to and in Railway Service," by H. D. Bush (Member).

29th.—Informal meeting. Lecture, "The Production and Modern Application of Dissolved Acetylene," by W. C. Freeman.

During the above period visits will be paid to the Brimsdown Power Station of the North Metropolitan Electric Power Supply Co., to the London Scottish Foundry, Ltd., at Barking, and to the Metropolitan Water Board's pumping station at Walton-on-Thames.

Harbour Engineering Notes.

USING WASTE FUELS FOR POWER GENERATION.

There exists a very wide field for the use of refuse fuels for the generation of power, such as the sawdust from timber mills and other similar substances. This material has in the past been burned under boilers for steam generation, and this method has been fairly successful, though a much more up-to-date system is to employ these fuels in a producer and then to use the gas generated.

An interesting producer plant is that designed by Crossley for gasifying a wide variety of fuels. In the Crossley plant the producer consists of a casing constructed of thick mild steel plates completely lined on the inside by best quality firebrick. This firebrick lining also completely protects the top cover plate, thus preventing overheating and the corrosive action of acid vapours which are distilled from some classes of fuel. The producer is generously proportioned, consistent with the generation of good quality gas, to suit the power ratings specified for various fuels.

When light fuels such as wood chippings and sawdust are to be gasified, it is essential that the gas be drawn from the fuel bed at approximately the same velocity as the combustion air passes through the fire, in order to prevent the fuel from being drawn over with the gas. In the Crossley design this is accomplished by making the area of the top of the fuel bed as nearly as possible equal to the area of the gas-making zone.

The firegrate of this producer, through which the air for combustion is distributed to the fuel, comprises a series of cast-iron annular plates arranged one above the other in steps, taking the form of an inverted flat cone, with the outside edge of each succeeding lower plate so disposed to lie beyond the angle of repose of the fuel, which falls through the opening in the plate above.

These grate plates are supported independently of the rest of the producer on cast-iron stools, and can be removed or replaced without disturbing any other part of the producer.

Owing to the comparatively high moisture content of nearly all classes of waste fuels, little or no steam is required for gasification purposes, but should it be necessary at any time to turn over to mineral fuel, which can also be gasified in the producer, provision is made for generating a supply of steam by feeding water on to the stepped fire grates.

Large doors are bolted to the shell around the ashpit, providing access for the removal of clinker and ash. These doors can be opened at any time and cleaning operations carried out while the plant is at work without disturbing the process of gas production. Some of these plants have worked for a year without the fire having to be withdrawn for any purpose.

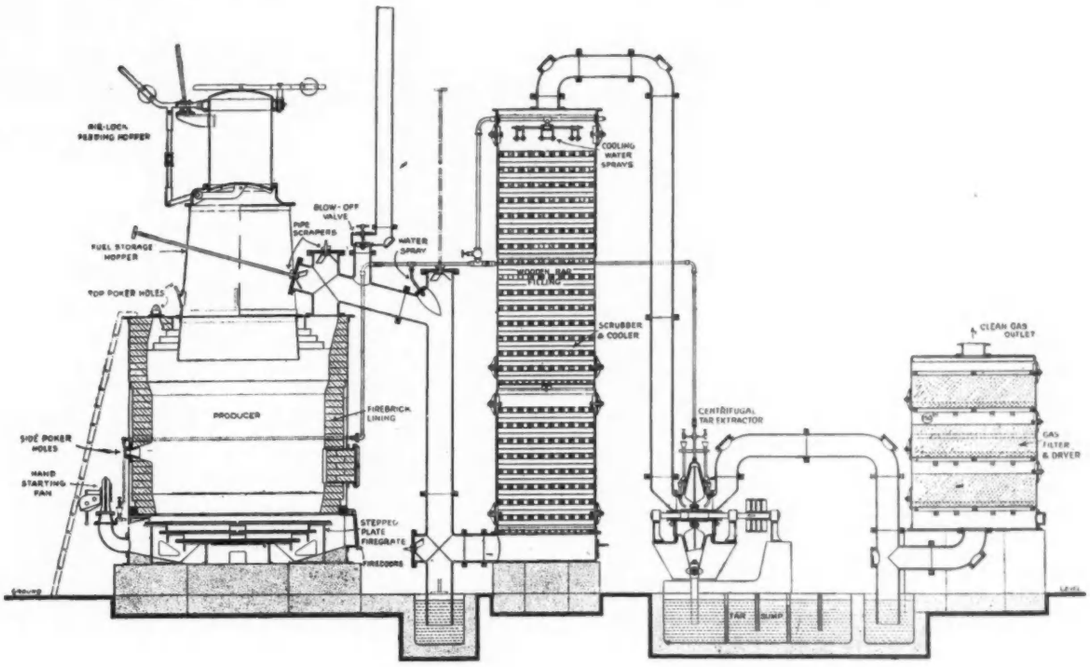
The adaptability of this plant for all classes of fuel is largely due to the air-lock feeding hopper, which enables the power user to adopt any working level to suit the class of fuel used.

The complete plant is shown in the diagram, and it will be seen from this that the feeding hopper consists of a large fuel container fitted with upper and lower valves which form an air lock, thus preventing air from entering the producer during the feeding operations. There is not the slightest danger of explosion or interruption in the gas supply. The upper valve is of the swing-balanced type, and the lower valve is of the mushroom type, hand-operated by a system of levers from the charging floor. A device is fitted for locking the lower valve in its closed position, the upper valve also being locked in the closed position. When open, the lower valve falls completely clear of the fuel container, and thus offers no obstruction to the passage of light or stringy fuels.

Scrapers are provided for clearing the gas outlet pipes of tar and dust deposits while the plant is in operation. A water spray is also fitted in the vertical pipe leading to the gas cooler for washing the heavier particles of tar into the water-seal pot at the base of the pipe.

The waste or blow-off valve and pipe used to provide a draught through the fire during standby periods is so placed that any condensate from the damp fuel drains into the seal pot and not into the producer. This is important, because the condensate is usually of an acid nature, and, if allowed to drain back into the producer, sets up corrosion of the steel shellwork.

For cooling and washing purposes, preparatory to tar removal, the gas enters a cylindrical cooling tower consisting of two compartments filled with wooden grids arranged one above the other. In its passage through this tower the gas is thoroughly cooled by intimate contact with streams of water supplied by an unchokeable splashplate system of water sprays situated above the top grillage.



Leaving the top of the cooler, the gas next enters the Crossley mechanically driven tar extractor, where it is subjected to a combined heating and centrifugal action, which throws out the tar on to the sides of the casing, from whence it is washed into the collecting sump by a continuous spray of water.

The last stage of the cleaning plant comprises a combined expansion box and wood, wool, or sawdust filter, which acts as a final dryer. The gas leaves this vessel clean and dry for power or heating purposes.

These plants have been used in a wide variety of industries, but one of the most interesting is the installation of a Crossley Premier wood fuel gas power plant on board the tin dredger "Cambria." The dredger itself was constructed to the order of the Tavoy Tin Dredging Corporation, Ltd., London, by Werf Conrad, of Haarlem, Holland, and the power plant consists of two Crossley Premier multi-cylinder gas engines, one 400 b.h.p. and the other 200 b.h.p., developing their power from the suction gas from the refuse wood fuel plant.

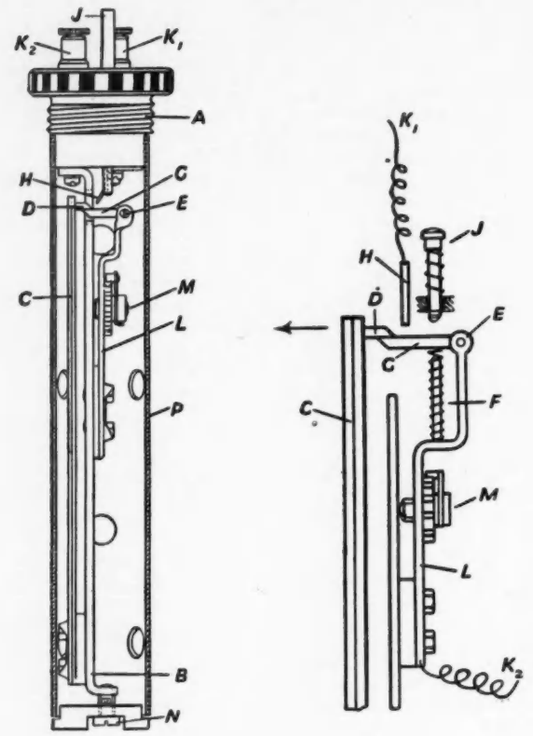
TEMPERATURE RELAYS.

Considerable development has taken place during recent years in the design of relays of various types for the protection of electrical apparatus, and one of the most interesting of these is the temperature relay. One of these is the Hackbridge relay, the principle of which is shown in the diagram.

This apparatus is designed to serve for the protection of power transformers against excessive overheating, no matter what may be the cause, and it will function perfectly on either small or large transformers. The operating range of the device is adjustable between 50 deg. C. and 120 deg. C., in steps of 5 deg. C. Each relay is tested and set to an accuracy of plus or minus 0.5 deg. C. The switching operation is performed by a small quick-break switch which is completely immersed in oil. This small switch is designed with sufficient length of

path under oil to enable the line voltage to be used for any signal apparatus or auxiliary equipment. It is thus possible to dispense with any kind of auxiliary current or storage battery.

The apparatus can be made for open circuit or, where used with special danger indicating systems, for closed circuit operation. The latter type can be supplied with a resistance of 1,000 ohms, which is connected between the two contacts. The principle of the relay is that of a bimetallic strip which is bent when heated and releases a quick-break switch which opens or closes the circuit through the contacts K1 and K2. The contacts are designed to carry 6 amperes at 240 volts, but a proportionately lower current at voltages up to 600 can be employed where the contacts are immersed in oil.



The relay is mounted in an insulating cylinder, P, and is screwed in the cover of the transformer tank by means of a 1-in. gas thread. Where the tank is under pressure from a head of oil, such as when a conservator is being used, it is necessary to weld or screw a pocket into the lid of the tank and screw the relay into this pocket, the pocket being first filled with oil. On a transformer without a conservator, the device can be mounted in the lid and set for operating either when immersed in the oil or merely from the hot air in the upper part of the tank. A special long model is made which is 2½-in. longer than the standard.

To reset the indicator for operation again, it is only necessary to press the button J, situated between the terminals K1 and K2. A relay with a remote control switch for resetting is in course of construction by the Hackbridge Electric Construction Co., Ltd.

ELECTROCHEMICAL DEPOSITION IN ENGINEERING.

Deposited metals continue to play a larger part than ever in the engineering world, and new applications are continually being found for base metals coated with some more costly metal which resists corrosive influences. Many heavy industries now make use of parts that have been " Fescolised," i.e., metals with a covering layer of nickel, chromium, copper and cadmium.

An essential feature of the process is that there shall be interlocking with the base metal so that the deposit is rendered unstrippable. It differs in this respect from plating, in which system a metal is applied in a layer, which is not homogeneous with the material upon which it is imposed.

By the Fescol process any required thickness or depth of deposit can be applied, though heavy coatings have commercial limitations and are naturally controlled by the object and the price of the parts treated. For instance, it might be quite economical to pay more than the first cost of the part treated, if immunity from corrosion, erosion, or delay through stoppage of plant can be avoided.

There is a considerable amount of plant which is exposed to erosion and corrosion, either due to atmosphere, sea, brackish or fresh water, chemicals, gases, acids and alkalis. Some of the more expensive metals will withstand such conditions, but while it would be absurd to instal some machinery parts of expensive corrosion-resisting metals, it will very often pay to have those parts protected by a layer of metal which forms a protective coating, and pure nickel, copper, chromium, cadmium or cobalt can be applied in the desired thickness to such base metals as steel and cast iron at a fraction of the cost of the more expensive metals.

There is also another aspect of this process which is of interest in these days when economy is essential. All moving parts of machinery are naturally subject to wear, and their useful life is in consequence limited by the permissible reduction in area or diameter, after which time the part is ordinarily fit only for the scrap-heap. It is here that the electrodeposition process steps in and saves the cost of replacement.

The part can be rebuilt with a deposit of nickel until the original or any required dimension is attained, and the restored part usually has a longer life than the original. The pure nickel applied by the Fescol process has a lower co-efficient of friction than ferrous or yellow metal, and is not subject to erosion or corrosion so obvious in the former. When ultimately the surface has again to be replaced, this can be done as often as required.

It is stated that economy in this direction actually starts when treating an initial wear of 0.010-in., hence the greatest economy is realised when the part has worn not less than 0.010-in. and up to 0.040-in., though, of course, any deposit can be applied within the limits of the thickness of commercial utility, and, the more expensive the item, the greater the saving.

NITRALLOY.

Nitriding is a process by which special steels are surface-hardened at low temperature by the action of ammonia gas. This type of steel, possessing the properties of extreme hardness and wear resistance combined with tough core having high impact and tensile strength without material deformation or distortion, has been for many years the goal of both the makers and users of steel for certain specific requirements. The hardness imparted to the steel will scratch glass with ease, and special testing files are worn smooth without effect on this extremely hard surface. Wear tests or abrasion tests made on these hard steels have shown them to be unapproached by any other steel in resistance to wear from the erosive action of superheated steam or hot oil vapours.

Hardness, as interpreted at the present time, is a very indefinite subject, and in order to discuss this subject intelligently it is first necessary to determine what is hardness. The definition of hardness that will correspond to any physical value is a definition yet to be found. In the various methods that are used for the measurement of hardness it is believed that there is at the present time no knowledge of what is really being measured, and these methods only allow for certain comparison without tying up to any physical property.

It is now well-known that bodies in thin layers have properties that differ widely from those they possess when they have considerable thickness, and their mechanical properties obey this law in the same manner as do their electrical, optical or magnetic properties. When a layer of a given body has a thickness of less than fifty microms, the usual properties begin to modify; for still thinner layers there is still greater change, and the bi-molecular or mono-molecular layers of liquids or gases no longer have the ordinary properties of liquids or gases, and they adhere to solids with the strength that was previously unsuspected.

It is apparently a simple matter to determine the thickness of the case, as bars 15mm. in diameter notched in the centre are placed at various points throughout the material under treatment, and, after treatment, these notched bars are broken and the depth of the case examined under a microscope with a micrometer attachment. The uniformity of the case may be determined in this instance by the use of a small bar 10mm. in cross-section which is placed throughout the load, and then this bar taper ground from one end to the other, being tapered in such a manner that it starts with only 0.001 under the skin to a maximum of 0.050 and measurements are made along the bar that has been ground to correspond with this thickness.

Of tons of work that has been nitrided under laboratory supervision, no brittleness of the case has been found. This, however, must not be construed to mean that nitriding does not impart brittleness; it does, unless certain precautions are taken.

In the production of nitrided cases, valves, for instance, are assembled before the nitriding operation, and it is found that very little grinding has to be done in order to true up the surface, and it must be remembered at this time that some of these valves must withstand 5,000-lb. hydrostatic pressure without any signs of leakage between the two nitrided surfaces.

One of the most severe conditions that can be applied to nitrided steel is the operation of valves at temperatures in the neighbourhood of 900 deg. F. and the opening and closing of these valves under unbalanced pressure.

The seizing and galling of seat rings and discs in the operation of steam power plant valves has been of considerable importance to the power plant engineers, because valve seats gall and seize with the result that, after operation, they are not water or steam-tight.

A certain test was made in a large steam station, in which valves were trimmed with monel metal, monel metal against stainless iron, and with stainless iron, and the maximum number of openings and closings of these valves without seizing at an unbalanced pressure of 400-lb. on one side and a temperature of 780 deg. was twenty-five times. With the nitrided steel this valve was opened and closed under the same conditions two hundred times without a single mark or scratch on the seat. Several other instances may be cited. For instance, in an overload valve in a large steam station, the valve was trimmed with stainless iron hardened to approximately 400 Brinnell, and after about thirty operations or ten days, the valve had completely failed.

With the same valves trimmed with nitralloy seat rings and discs, they had operated forty-nine days at the time when they were taken down for examination. During the examination it was found by the engineers in charge of the station that there was no visible sign of wear, sticking or seizing, and that they were in as perfect a shape as on the day placed in service.

Another instance that may be cited with regard to the wear resistance of nitrided steel in that a number of these valves were placed in an oil refinery handling slurry. Previously, valves lasted ten days on this service. The nitrided steel valves have been in service now for four months and are in just as good a condition to-day as they were when first put into service.

NEW SOURCE OF HELIUM OPENED UP.

A newly discovered source of helium in Texas has now been opened up, the gas being extracted from natural gas and shipped in specially designed tank cars to Langley Field, where it is used for U.S. dirigibles. The helium-bearing natural gas is transported from the wells to the extraction plant by the natural pressure of the wells, through a welded steel pipe 11 miles long. The helium content of the gas is 1¾ per cent., and the natural gas is cooled to a temperature so low that all the constituents except helium are reduced to liquids. This temperature is approximately that of liquid air and is below 300 deg. F. below zero. The helium is drawn off as a gas, and the liquids are then returned to the gaseous state by allowing their temperature to return to that of the atmosphere. A part of the gas resulting from the evaporation of the liquid is used as fuel to generate power to run the plant, and the remainder is discharged into a pipe for use as town's gas. The process of extracting helium is continuous and involves pressures as high as 2,500-lb. per sq. in. The helium is carried at a pressure of 2,000-lb. per sq. in., in specially designed tank cars, from the extraction plant to containers at Langley Field.

NEW CUTTING METAL.

Several announcements have appeared lately regarding tungsten carbide tools, and a further metal of this class, but of a slightly different type, is shortly to be marketed. This is known as " Haystellite," and was introduced a short time ago as a substitute for diamond on oil well bits and for drawing dies, for which purposes it has been very successful. A modification of the original alloy has been found valuable as a cutting metal, and is now going through its final shop tests. Most of the tungsten carbide tools at present on the market are prepared by the sintering process, and the alloy referred to is different in that it is a cast alloy.

Notes from the North.

LARGE DOCK DEVELOPMENT SCHEMES.

The fact that the Mersey Docks and Harbour Board is considering very large schemes of development on the Birkenhead side of the River Mersey, provided the Government is prepared to give financial assistance, was mentioned at the September meeting of the Birkenhead Town Council. The Mayor has been in correspondence with the Mersey Docks and Harbour Board. Whilst he was not in a position to state to the Council exactly what schemes had been prepared and what schemes the Board was prepared to go forward with, he was able to state that very large schemes of development on this side of the river, calculated to give employment to a large number of men, were contemplated.

LIVERPOOL PIER HEAD IMPROVEMENTS.

Liverpool City Council has decided that design premiums of 1,000 and 500 guineas be offered to architects and others for a scheme to improve the amenities at the Pier Head. It is considered that at present the Pier Head's general layout is a hotch-potch and unworthy as a setting for such buildings as the Dock Board, Cunard and Liver offices. Every liberty is likely to be allowed to designers in their suggestions for improving it.

ELLESMERE PORT AND BROMBOROUGH.

In the course of an inquiry at Port Sunlight conducted by commissioners of the Cheshire County Council into a proposal to make Bebington an urban district twice the size of Birkenhead, Mr. H. P. Glover, presenting the case for the extension of the Bebington Council's area, said that at Bromborough Pool there was nearing completion a dock which was being constructed at a cost of £1,000,000, and it was intended to connect it with the railway at Hooton. The entrance to the Manchester Ship Canal was at Eastham, and it was anticipated when the new dock was open that it would very considerably accelerate the commercial development along the river frontage at Eastham and Hooton. It was thought by the Urban District Council that the development of the industrial portion along the river frontage at Eastham and Hooton—which would be an outcrop of the development that had already taken place—should be under the control of the Urban District and of the County Council. If industrial development was to be encouraged along the river frontage, road and transport facilities must run side by side with it.

Mr. James Knox said he did not think that it was appreciated that the new dock was a larger dock than the Gladstone Dock in Liverpool, having a frontage of one and a half miles. As soon as it was finished it would probably mean big developments in the district. Within forty-three years 1,000 acres of land had been developed by Messrs. Lever Bros., industrially, and when this dock was opened there was a probability of further tremendous developments. In answer to Mr. Wooll, witness agreed that he could not compare the new dock with the Gladstone Dock in the matter of depth. The new dock would only take ships up to 10,000 tons.

Mr. Dunlop, for the Manchester Ship Canal Company, speaking at the Cheshire County Council inquiry as to the proposal to extend the boundaries of Ellesmere Port, said the canal company considered their land would be developed east, west, and south. At Ellesmere Port the company had a complete railway system and a dock system. The company had constructed their own road to serve the oil industries up to the Eastham boundary with the intention of continuing it when it became necessary later on to develop the land lying further on the east of the River Gowey. In the last few weeks the canal had secured a new paper industry which would give rise to erection of over a thousand houses. He estimated it would mean some 4,500 workpeople.

MERSEY BAR LIGHTSHIP.

The combined weight of the two anchors of the Mersey Bar Lightship is something like three and a half tons. The last time the Bar Ship was brought into graving dock for refitting 14 tons of mussels were scraped from her. Her name is " Alarm " and she was built in 1912.

NEW BIRKENHEAD DOCK BRIDGE.

At the West Float Dock, Birkenhead, there is now being constructed an electrically operated bascule bridge which, when completed, will be one of the finest bridges of the Mersey dock system. The contractors are Sir William Arrol and Co., Ltd., of Glasgow, and the work, which will extend over a period of about twelve months, is estimated to cost £41,794. The new bridge will be a novelty for cross-docks travellers since the other bridges are worked by hydraulic power and are of the swing type, while the new structure will be electrically controlled from a raised machinery house on the Birkenhead quayside and when lifted will be more than 100 feet high. The bridge will resemble the Queensferry bridge, though it will have a larger span. Another interesting feature will be the fact that Wallasey bound traffic will be at least 78-ft. from the quayside when halted at the gates when the bridge is " off " or " up," and there will also be gates at the other end of the bridge.

During the last few weeks the foundations have been prepared. Pumping has been in progress and " limpets " have been forced to the quayside to hold back the pressure of water at points where the underground operations approach within a few feet of the dock wall. One roadway of the existing swing bridge has been closed. After the foundations have been laid, the work of assembling the bridge will be begun and will, it is expected, continue until about July next year. The bridge will be superior to any of the existing dock crossings which are hydraulically worked. It will be the Scherzer, rolling, lift-type. The roadway will be 23-ft. 6-in. wide with two rail tracks and there will be two footpaths, each 5-ft. wide on either side. The roadway will not have a dividing partition. The total weight of the bridge, including ballast (750 tons), will be 1,100 tons. The bridge will have an overhead clearance from the road level to the inside of the portal girders of 16-ft., so that the largest modern double decker motor omnibuses and coaches can cross with ample margin to spare. The bridge will bear the weight of the heaviest modern locomotives. Birkenhead Corporation will supply the electrical power for operating the bridge. The main driving gear will be mounted in an elevated machinery house built on trestles across the road on the Birkenhead side, the distance between the inner trestles being 37-ft., so that the free movement of traffic will not be impeded. The two driving motors for lifting and lowering the bridge will have a capacity of 45 h.p. and the electric supply will be 3 phase, 400-volts, 50 cycles. The times required for operating the leaf and nose volt for opening and

closing the bridge will be: (a) Electric power and high gear against light wind, 1½ minutes; (b) Electric power and low gear against high wind, 6 minutes. The electric motors may be used singly or together as required. The bridge will also be equipped with hydraulic energy for use in case of emergency. There will be a screw-down brake mounted on the differential pinion shaft and this brake will have a holding capacity equal to a wind pressure of 40 lbs. to the square foot on the fully open span. There will also be two contactor operated brakes.

Excavations are being made for the reinforced concrete foundations which will be hammered down almost to the bed of the dock. Almost within a stone's throw of the new bridge operations, another scheme is in active progress, the quay wall being levelled for the construction of another warehouse shed, while on the opposite side of the West Float the provision of an up-to-date coal conveyor in place of the existing coal hoists will soon be undertaken.

CRANE FATALITY AT BROMBOROUGH DOCK.

One of the three 2½-ton cranes used at the new Bromborough Dock recently toppled over and caused the death of the driver. It appears that two wheels of the crane mounted the scotches, causing it to tilt. At the inquest, it was stated that the crane, a Butler, was in good condition. Its radius was 17-ft. 8-in. and 50-cwt. lifting capacity. Definite instructions were issued that a 16-ft. maximum was to be used on the job. It was later found that the weight of the grab was 25-cwt. and the ballast 33-cwt., which was 8-cwt. over the safety mark. Arthur Montague Holbein, engineer in charge of the works, said the cranes were designed with a 25 per cent. margin of safety overloading. The effect of the increased radius would be to cut down that safety margin by half. On top of that, if the driver lowered his grab rapidly and there was a "surge," that would further reduce the safety margin. The scotching could have nothing to do with the crane tilting.

MORE SEABORNE TRAFFIC TO MANCHESTER.

The Manchester Ship Canal Company has issued a new schedule of charges on raw cotton to operate from October 1st, until further notice. The main item is the Ship Canal toll, which, under the new schedule, will be 6s. per ton. The reduction has been made possible by the increase in raw cotton shipments to Manchester which has resulted from the improved facilities which have been provided for dealing in the commodity here. Imports of cotton at Manchester during the 1928-9 season were 679,816 bales, or 121,068 bales more than in 1927-8. The Ship Canal's action in making another cut in its charges should cause a further increase in the volume of the traffic.

NORTH WALES ROAD SCHEMES.

Road schemes estimated to cost £400,000 were discussed at a special meeting of the Flintshire County Council. The main proposals are the Holywell by-pass and the straightening out of the bottle-neck road past Shotwick Aerodrome. Another matter discussed at length was the bridge over the River Clwyd at Rhyl. The surveyor said he had completed all the plans, and they were now in London. The structure of the bridge would be steel on a pier of concrete. It was decided to proceed with the erection of a new bridge at Gwastad.

NEW GRAIN STORAGE PLANT.

The new grain discharge plant for the Liverpool Grain Storage and Transit Company, Ltd., at the Alexandra Dock, is expected to be completed by the end of next month. The new plant will handle 500 tons an hour, which in ordinary practice means an output of slightly less than 4,000 tons a day. It is being constructed at the No. 2 Alexandra Dock, and being a quayside, not a floating plant, will eliminate the cost of barging and thus allow a considerable reduction and saving in working expenses as well as an economy of time which will greatly expedite sailing. The plant consists of two huge pneumatic intake elevators working on the vacuum cleaner principle, with conveying bands to transfer the grain direct from steamer hold to warehouse. The present plant is of the "overside" type using floating elevators, and when the new plant is ready it will be possible to discharge a ship by the new and the old method at the same time.

RAILWAY OWNED DOCKS.

At a meeting of the Liverpool Chamber of Commerce, attention was directed to the inquiry at present before the Rates Advisory Committee in regard to the charges levied on railway owned docks. Mr. R. V. Edwards said he recollected that in this case the Chamber had supported the Mersey Docks and Harbour Board when the question of uneconomic charges at railway owned docks had been argued before the Tribunal. The present application of the railway companies for powers to increase charges went to substantiate the contention of the Chamber and the privately owned dock authorities that the charges levied by the railway companies were uneconomic. It might be anticipated that in the near future the disadvantage suffered might in some degree be corrected.

WHAT WAS DONE IN 40 HOURS.

Another instance of a liner's quick turn-round at Liverpool is furnished by the Canadian Pacific liner "Duchess of York." She arrived at Liverpool on a Wednesday and at 1.52 p.m. was berthed at the Gladstone Branch Dock. She commenced to discharge 3,100 tons of cargo including 1,280 tons of grain, at 3 p.m. The discharging of the general cargo was finished at 10 a.m. on Thursday, the grain being discharged overside by 1 p.m. Loading of outward cargo was commenced on the Thursday and was completed by 11 a.m. the following day when she sailed. The number of hours worked was forty-four and the cargo dealt with was 5,100 tons.

BLASTING THROUGH SANDBANKS.

In connection with the scheme to prevent coast erosion at Blundellsands, a start has been made on the blasting operations under the direction of Mr. T. Mellard Reade, the Liverpool and Blundellsands surveyor. The blasting is being carried out in order to force a channel between the sandbanks, thus giving the River Alt an outlet to the sea from a more northerly point, and preventing further encroachment in the neighbourhood of Burbo Bank-road.

The "planting" of the first charges was easy work. They were put in 6-ft. deep at the rate of about one a minute. But when the workers got well on to the sandbank they came across layers of very heavy sand or thick mud, and it took a gang of men about a quarter of an hour to get each charge laid, and some of the charges could not be planted to the full depth. Although the explosion had terrific force, much of the mud thrown up fell back into its place. The section of channel made by the first explosion was about 2-ft. deeper than the section made by the second explosion. The new channel, if it can be made, will be about 500-yds. long, and will shorten the winding course of the Alt by something like a couple of miles. Strangely enough, a water shortage was one of the handicaps of the operations. The sandbank which is being divided stands high above low water mark and there are no pools upon it, so the workmen had to supply water for the pumps which served the hole-boring hands. This was one of the chief reasons why the whole job could not be finished in one or two huge explosions, but had to be done a piece at a time. So each new crater was made to supply water to wash out the charge holes for the next one. After the above-mentioned operations had been carried through, a meeting of those who were meeting the cost of the works was held and it was decided to suspend operations for the time being.

SEA DEFENCE SCHEME.

Llandudno Council has initiated a sea defence scheme. The scheme was adopted at Friday's meeting, when it was stated that the defences would consist of six groynes on the North Shore beach, a spur near the Grand Hotel, a length of wall, and an extension of the lifeboat slipway. The Council is to discuss making a swimming pool between the pier and the foot of the Marine Drive with the dual object of helping to arrest the erosion of the Great Orme, and providing visitors with an extra attraction. The baths will cost £5,000 and this addition will increase the cost of the sea defences to over £18,000.

NEED FOR NEW WYRE BRIDGE.

The question of bridging the River Wyre in the neighbourhood of Fleetwood is again engaging the attention of the local authorities concerned. The prime movers are the Fleetwood Council, and measures are being taken to authorise the Clerk to the Fleetwood Council, Mr. A. Cottam, to call a conference of local authorities who are vitally interested in the provision of a new bridge and the necessary approaches. A short time ago the Fleetwood Council considered the question of erecting a transporter bridge similar to that at Middlesbrough across the River Wyre from Fleetwood to Knott End, but the enormous cost killed the idea.

For a distance of over four miles from its entrance to the sea at Fleetwood at present there are no means of crossing the River Wyre except by ferry steamer, and although the distance between Fleetwood and Knott End, on the opposite side of the river, is less than half a mile, yet the distance by road between the two points involves a detour of 14 miles.

WALLASEY FORESHORE IMPROVEMENTS.

Foreshore improvements are contemplated by the Wallasey Corporation, which proposes to make an early start on the work of constructing the extension of the New Brighton Promenade to the Red Noses. The first portion of the work to be undertaken will be that of constructing a sea defence wall from the Perch Rock Battery to the Red Noses. A start would have been made some months ago but for the fact that an objection was raised by the War Office authorities on the ground that any extension of the promenade would interfere with the line of sight and of fire of the battery guns. After several visits to New Brighton of War Office representatives and interviews with the authorities in London, the objection has now been withdrawn. The total cost of the

whole scheme of promenade extension westward was, when the Wallasey Bill was promoted, estimated at £870,000. The first portion to the Red Noses is to cost £230,000, the marine lake £75,000, and the swimming pool, dressing boxes and cafe £67,000. The marine lake will extend over twelve acres between the battery and the existing promenade, while the open air bath will extend over nine acres, measuring 330-ft. by 220-ft.

NEW COALING PLANT AT ELLESMERE PORT.

New coaling plant, the first of two double units, has been erected at Ellesmere Port by Messrs. F. Turnbull and Co., Ltd., of Heaton Junction, Newcastle-on-Tyne. The installation comprises a double unit. The maximum capacity of each set of conveyors is between 400 and 450 tons per hour, so that the combined capacity of the two is from 800 to 900 tons per hour, but means have been provided whereby the rate of loading can be reduced to 100 tons per hour each. Coal is brought in wagons in two fixed tipping hoppers over sidings, the receiving hoppers having a capacity of about 20 tons. End-door wagons having a gross weight of 22 tons are principally used, but, of course, with those fitted with doors in the bottom, it is unnecessary to make use of the hydraulic tippers. Provision has been made for the fitting of an auxiliary ram which will enable wagons of a gross weight of 30 tons to be dealt with. The hydraulic supply to the tipping ram is at a pressure of 700-lb.—750-lb. per square inch. At the outlet of each hopper there is a regulating door and from it the coal is delivered on to a jigging feeder chute, which in turn delivers the coal to the first of the two band conveyors. A short stationary plate chute curved at its lower end, is fitted between the jigging chute and the conveyor, in order to project the coal on to the latter in the direction of travel and at approximately the same speed as the conveyor. The first conveyor carries the coal a distance of 126-ft. up an angle of 18 degrees and delivers it to a second and underslung conveyor, which is provided with what might be described as a telescopic movement, and which can be adjusted to suit the beam of the vessel to be loaded. This telescopic conveyor, at a distance of 57-ft. from the inner drum, is further provided with a pivot giving a radial movement in a vertical direction, which provides for a wide range in the height of the loading point. From the end of the adjustable loading arm the coal is discharged into a rotary spout which can be swivelled in a complete circle horizontally so that coal can be trained in the hold or hatchway in any desired direction. The whole of the operations except those concerned in the tipping of the wagons are controlled by one man in a control cabin which is placed in a position overlooking loading operations at one side of the hoisting machinery platform. The machinery is driven by electric motors using direct-current at 500-volts. and separate motors are installed for each motion. The main cable is carried up to the control cabin along the bridge from whence current is distributed to the various motors through gear and controllers which are grouped around the driver's stand. The Manchester Ship Canal at the point where the installation has been carried out, has been dredged to enable ships to load down to 28-ft., so that vessels taking in their cargo at Manchester or other places eastward of Ellesmere Port may take advantage of the increased draft by shipping their bunker coals there, or, if oil driven, they can take up their supplies of liquid fuel at the adjacent oil depot at Stanlow.

PROPOSALS FOR A NEW HARBOUR.

Proposals to provide a harbour at Criccieth were discussed at the recent meeting of the Urban District Council, the initiative being taken by Major Richard Lloyd George, who submitted diagrams to outline what in his opinion would be the best course to follow for the making of a safe anchorage. He said that he had from time to time taken readings from the Castle Rock to the Esplanade at all states of tide and wind. There were three essential factors to be borne in mind —first, the provision of a small harbour for pleasure boats, etc.; secondly, to endeavour to stop the severe coast erosion; and thirdly, nothing must be done which would endanger the Esplanade. During a recent visit to several small places in Devonshire, where there were harbour facilities, there was an air of prosperity about the places. The harbour would be most useful when holding regattas, and would contribute towards the popularising of motor boat cruising, which craft were very delicate and required safe anchorage, and if aviation became more popular, as he believed it would, places which could offer protection for the planes would out-do those which had not got the requisite facilities for shelter. The dues received should be quite sufficient to keep the harbour in repair. He suggested that a breakwater should be built from the Castle Rock, taking a line south-east, which would take the full force of the south-westerly gale.

Mr. John Edward Williams pointed out that some time ago it was intimated that the cost would be £30,000 and even then it could not be guaranteed that the anchorage would be a safe one. He was afraid that some people were under the impression that there had been a safe anchorage before the present breakwater was built. He took the opportunity of drawing attention to the good work done at Dwyfor by Mr. David Cadwalader and Mr. William Edwards. These two men had greatly improved the Dwyfor entrance. There was a time when a boat drawing 3-ft. of water could not be taken there, but as a result of the steady work of these men the river had been deepened to an extent accommodating a craft drawing 4-ft. 6-in. of water. The time now seemed opportune for the Council to take advantage of the work done by these men with a view to further development. It was a suggestion which he felt confident was worth considering and for an expenditure of, say, £500, Dwyfor would provide them with a natural harbour.

Major Richard Lloyd George expressed himself of the opinion that the two proposals were part of a whole, but the great drawback of Dwyfor was that they could never do away with the bar without dredging. Dwyfor was essential to any harbour in Criccieth.

The Council adopted the following resolution:—"That having heard Major Richard Lloyd George's explanation of a possible scheme for the construction of a harbour for Criccieth, this Council is of opinion that it would be in the interests of the town that Lord Harlech be approached with the view of ascertaining whether he would be prepared to consent to the construction of a pathway round the Castle in the event of the Council subsequently deciding to proceed with the suggested scheme."

Canadian Notes.

THE CANADIAN GRAIN TRADE.

The Dominion Bureau of Statistics at Ottawa has forwarded to the High Commissioner of Canada in London its Final Report on the grain trade of Canada for the crop year ended July 31st, and to the close of navigation, 1928.

Features of earlier issues of the Report, which is a booklet of 206 pages, have been somewhat extended and enlarged. The movement of grain from the head of the Great Lakes to Buffalo and Montreal has been aggregated. An arrangement was completed in March, 1925, whereby the United States Department of Commerce furnished the Dominion Bureau of Statistics monthly with a statement recording shipments of Canadian wheat and wheat flour from United States ports by countries of destination. In view of the difficulty which has for many years been experienced in harmonising statistics showing Canadian grain exports with figures of other countries recording imports of grain from Canada, these data are valuable for the light thrown on the export movement of grain from the Dominion by shipping routes.

The Report gives data—accompanied by charts, showing the movement of Canadian wheat, oats, barley, rye and flaxseed during the year 1927-28, and illustrates also the movement of United States and Argentine grain through Canada during the same period. Statistics relative to flour milling in Canada during the year are included.

The Report may be consulted at the Canadian Building, Trafalgar Square, London, S.W.1, and copies are obtainable on application to the Dominion Bureau of Statistics at Ottawa, Canada.

NEW LAKE STEAMSHIP TERMINALS AT ONTARIO.

The Canada Steamship Lines, Ltd., has begun work on the construction of a new terminal at Hamilton, Ontario, the facilities to be modelled on the one constructed not long back at Toronto at a cost of $2,000,000.

The facilities to be provided in Hamilton Harbour will consist of 600-ft. of wharf paralleled by a railway siding and an unusually large space for trucking and teaming purposes. The shed will be a reinforced concrete construction, and will contain ample office accommodation for the local staff. Extensive dredging operations will have to be carried out before the new terminal can be placed in commission, though it is expected that the entire structure and wharf facilities will be completed by the opening of navigation next year.

This new terminal will be the western point of freight handling for the Canada Steamship Lines express package cargo service, which is operated by the "City" class freighters between Montreal, Kingston, Toronto and Hamilton on a 36 to 40-hour schedule.

It is stated that the Hamilton terminal extension has been under consideration for some time, and that it forms part of the general plan for improving the Company's facilities throughout the St. Lawrence—Great Lakes system. Blue prints have already been prepared with a view to further expansion at other points when the anticipated increase in traffic volume justifies the provision of such improved facilities.

QUEBEC HARBOUR COMMISSION.

The High Commissioner of Canada in London has received from the Quebec Harbour Commission a copy of its Report for 1928, which contains detailed information relative to the facilities now available at the port for ocean and coastwise

shipping, these including a large concrete fireproof grain elevator with a storage capacity of 4,000,000 bushels. Grain shipping can be carried on at about 90,000 bushels per hour and unloading of lake barges at a speed of about 40,000 bushels per hour, in addition to 120 railway cars daily.

Facilities are available for the shipment of cattle, the shed having accommodation for 2,000 head, and coal companies have five towers for discharging and loading coal. A modern cold storage warehouse is available with a capacity of 500,000 cubic feet, together with a fish freezing house having a storage capacity of 1,000,000 pounds.

During the year considerable progress has taken place in the development of the port for grain shipments, no less than 11,063,761 bushels having been handled during the navigation season. The grain movement has been much benefited by the ruling of the Board of Railway Commissioners to the effect that freight rates on grain from Georgian Bay ports to Quebec should be the same as those current in respect of grain shipped through Montreal. The new eleven per cent. rate from Winnipeg to Quebec via the National Trans-continental Railway, is also stated to have been an unqualified success.

A copy of the Report in question may be consulted by persons interested at the Canadian Building, Trafalgar Square, London, S.W.1.

PORT OF SAINT JOHN, NEW BRUNSWICK.

The High Commissioner of Canada in London has received from the Board of Harbour Commissioners at Saint John, New Brunswick, a copy of their first Report dealing with the calendar years 1927 and 1928.

The control of the harbour of Saint John was taken over by the new Board of Harbour Commissioners on the 1st August, 1927. Previous to this date the operation of the port was under the dual control of the City of Saint John and the Dominion Department of Marine and Fisheries, whilst the Department of Public Works of Canada carried out the necessary construction and maintenance work for the properties operated by the Marine Department.

The Report gives details relative to the warehousing and berthing facilities available in the port, and mentions that a steady increase has taken place in the quantity of grain shipped annually, the maximum shipments being during the season 1926-27, when 25,885,000 bushels were despatched, the bulk of which was handled by the Canadian Pacific Railway Company's elevators at West Saint John.

Parliament having given sanction for a loan to the Harbour Commissioners, active work is in progress on the provision of new facilities, the initial expenditure of which vote in the season 1927-28 is $5,000,000. The new facilities in question include a new pier 800-ft. long and 300-ft. wide, work on which was begun in August, 1928.

The full scheme approved by Parliament contemplates the construction of two piers, each 1,250-ft. in length and 300-ft. in width on each quay, while the width of the berth between the piers is to be 400-ft. at the outer end, converging to 300-ft. at the inner end, with a draft of water 35-ft. below extreme low tide.

The piers are to be readily accessible both to the Canadian National and Canadian Pacific Railways, provision being made for the construction of a bridge across Navy Island.

The total grain elevator accommodation available in the port at the present time is 2,100,000 bushels. Work has, however, commenced on the construction of a new grain elevator with a capacity of 1½ million bushels, the eventual capacity contemplated being 3 million bushels.

VICTORIA (B.C.) COLD STORAGE TERMINAL.

At the opening of the new plant of the Victoria Cold Storage and Terminal Warehouse Company, Ltd., recently completed at a cost of $550,000, it was announced that a contract had been signed with the Island Packing Company, Ltd., for the warehousing of eight million pounds of fish annually. The Company has also agreed to co-operate in developing the frozen package fish industry—a new industry for the port, and one which is in its infancy on the American Continent. The fish will be brought straight to the cold storage plant by the fishing boats, filleted and then frozen by the rapid brine system.

The fish unit of the warehouse has been equipped with a storage plant for more than 5,000 tons, or 10,000,000-lbs. of fish. Three brine tanks, each with a capacity of five tons, in in which the brine is kept rapidly moving by agitators, will freeze 15 tons of fish every three hours. The fish, properly frozen by the brine process and enclosed in a protective glaze of clear ice can be shipped long distances without deterioration and can be held indefinitely in storage without change in food value, flavour or appearance.

The plant is situated on deep water, with plenty of deck space for trawlers and ocean vessels. It will be served by two branch lines from the Canadian National Railways leading to either side of the plant, and accommodation is provided for the simultaneous loading of twelve freight cars. The icing unit is capable of producing 45 tons per day, and electric machinery will deliver block or crushed ice direct into the boats or cars for transportation.

In addition to the handling of fish, the new warehouse will be of great utility to exporters of apples, eggs, butter and other agricultural products.

The Victoria Cold Storage and Terminal Warehouse Company, Ltd., is capitalised at $2,000,000, and the City of Victoria has guaranteed interest at 7 per cent. on $500,000 of the bonds of the Company for the first ten years of operation.

It is probable that millions of pounds of fresh fish specially prepared, filleted and packaged will be shipped annually from Victoria to various points in North America and that about 150 trawling vessels will be based on that port.

The Island Packing Company entered the west coast fishing industry last autumn, and in less than one year has spent more than $500,000 in plant and equipment for the handling of pilchard products and other fish, having already a large fleet of fishing vessels on the west coast of Vancouver Island.

Irish Harbour Matters.

SALVING THE "CELTIC."

It is possible that, before November next, the White Star liner "Celtic," which ran ashore off Roche's Point at the entrance to Cork Harbour, last December, will be removed from her present position for dismantling at the former British Admiralty dockyard at Haulbowline. This possibility, however, depends upon the success of the efforts now being made to refloat the vessel before the winter storms commence. The funnels and masts have been removed, and the work of removing the upper decks is proceeding.

The firm in charge of the salvage operations have, it is understood, decided to revert to their original intention of utilising compressed air to displace the water in the holds and so refloat the vessel.

This scheme entails the abandonment of the plan to use hundreds of hermetically sealed barrels in the form of a raft for the purpose, and, if successful, will expedite the work considerably.

The floating crane, brought over from Denmark in connection with the earlier stages of removing the upper decks, has proved useless, and a crane on rails has been placed on board.

Work has been considerably impeded by the presence of fumes of sulphurated hydrogen, created by the action of the water on the cargoes that still remain in the holds. One workman was overcome by these fumes, but the difficulty has now been overcome.

CORK AS A FREE PORT.

Cork Harbour Commissioners have decided to supply maps and whatever other information may be required by Mr. Mullan, Executive Vice-President, Ireland Corporation of America, in connection with his scheme for the development of Cork Harbour. Mr. Mullan and his colleague, Mr. Foley, are of opinion that Cork is the natural place for a free port, and that the setting up of a free port would benefit the country and the trade relations between Cork and America.

From their accounts, he concluded that they could finance the project out of income without any support from the Government. Two of the leading ports of Europe—Hamburg and Copenhagen—were free ports and owed their development to that fact. As a free port, the Harbour Board would also be in receipt of an income from the Government as a Customs Station.

Mr. Horgan pointed out that before such a port could be established it would be necessary to have a Bill passed by the Dail and Senate.

DOCK EXTENSION IN LIMERICK.

Plans are now in preparation for the extension of Limerick dock accommodation. The object of the Harbour Commissioners is to extend the dock westward and deepen it so as to admit ships of 24-ft. draught direct to the quayside. The dock can now accommodate vessels of only 22-ft. draught, and many vessels carrying grain cargoes are obliged to stand out in the river for many hours. The port at present has no liabilities and has a sum of £52,000 invested for expenditure on development. In addition to their invested capital, the Commissioners have a borrowing power of £100,000, and it is felt that the outlay for the proposed extensions would be well within the resources of the Commissioners. The proposed extensions would be coupled with 950 yards of link railway line between the railway termini and the docks.

The extent to which the trade of Limerick is increasing may be judged from the fact that the revenue surplus over extended exports increased by £6,426, while imports showed a corresponding increase of £8,455.

It is estimated that 250,000 tons of grain are imported here annually.

WHITE STAR MOTOR LINER.

The first motor vessel for the White Star Line was launched during the month at Belfast. This liner is 27,000 tons and has a length of 680-ft., with accommodation for 1,550 passengers (cabin, tourist and third class).

Ceylon and Indian Notes.

PORT OF COLOMBO IN 1928.

The year 1928 was satisfactory so far as the work at the Port of Colombo is concerned. The trade of the port has slightly increased, although the values of goods have decreased. The number of ships entering the port and their tonnage increased during the year. The oil fuel trade at the port has remained practically stationary. There has been a slight decrease in the number of ships bunkered with oil fuel and in the quantity of oil bunkers. Coal shows a decrease, both as regards imports and as regards coal bunkers. It remains to be seen whether this decrease will be continued, and whether as a consequence land at present used for coaling purposes will be relinquished when the present leases expire. The facilities provided at the port continue to be generally satisfactory, and everything is done with the means at the disposal of the Commission to cope with the developments in the trade of the port.

TRADE OF THE PORT.

The trade—imports and exports—of the Port of Colombo dealt with in 1928 amounted to 1,932,803 tons (1,200,374 tons imports and 732,429 tons exports), as compared with 1,845,512 tons (1,149,454 tons imports and 696,058 tons exports) handled in 1927. There has been a slight decrease in the trade of the port as compared with that of the previous year, but the increase was not as much as anticipated. This has been largely due to the slump in the rubber market. While the actual tonnage of imports and exports has increased, the value of the goods shows a decrease.

DEVELOPMENT SCHEME.

The Committee of the Colombo Port Commission, which was appointed in June, 1927, to consider the future programme of the development of the Port of Colombo, continued its labours throughout the year. Various important questions were considered by the Committee before being submitted to the full Commission. A report prepared by the harbour engineer on the development of the Colombo Harbour was considered by the Committee in November, and this report, with the covering recommendations by the Committee, has been laid before the full Commission. The report dealt fully with the lines along which the future development of the port should proceed. It is at present being studied by the members of the Commission. One of the chief proposals made is the provision of a deep-water quay and basin in the area between the Graving Dock and the North-East Breakwater. This, it is proposed to make up in three stages, roughly estimated to cost Rs.850,000, Rs.750,000, and Rs.1,250,000 respectively. This need of increased provision for dealing with naval vessels undergoing refit, vessels discharging or bunkering petroleum and its products, and vessels discharging coal, is constantly borne on the Commission, and it has been clear for some time past that the next large improvement work in the port must be the provision of an additional deep-water quay for these purposes. Not only is the Graving Dock Guide Pier being used for the above purposes, for which it was never originally designed, but the number of vessels using the Guide Pier has steadily increased in recent years, and it is worked to its full capacity.

DEEPENING OF COLOMBO HARBOUR.

Good progress was made with the programme of dredging sanctioned in 1927. The dredger " Sir William Mathews " was employed in extending the 36-ft. area, and the dredger " Sir John Coode " in the 30-ft. and 33-ft. areas. Good work was done by both vessels in their respective tasks. Of the 643 acres of low water area in the harbour, 186 acres have now been dredged to a depth of 36-ft. and over; 102 acres to a depth varying between 36-ft. and 33-ft.; and 147 acres to a depth between 33 and 30-ft.; the remaining 208 acres, lying inshore, have a depth of less than 30-ft. Six berths are available during the south-west and north-east monsoons for vessels drawing up to 33-ft. One of these berths can take vessels of any length.

CALCUTTA'S OVERSEAS TRADE FOR 1928.

Overseas trade figures of the province for the last year show that Bengal enjoyed a year of prosperity and steady progress helped by stable exchange of good crops and peaceful industrial conditions at home and abroad. Indian Jute Mills' profits amounted to seven crores 23 thousand against six crores 67 thousand in 1927. On the import side, piecegoods trade was disappointing, and it is believed to be partly due to permanent relinquishment of some of Calcutta's trade in favour of Karachi. United Kingdom's share in the total value of imports has fallen from 58—52 per cent., on the exports side.

BOMBAY PORT TRUST.

At a meeting of the Trustees of the Port of Bombay held recently, a lease for ten years was granted to Mr. Hasambhoy Jetha of a plot of land at Read Road, opposite the Bombay Dockyard Railway Station, for erecting shops with offices and residences above. Two renewals of leases on the Elphinstone and Mody Bay Estates were also granted on terms mutually agreed.

Estimates of expenditure for the following works were also sanctioned at the same meeting: (1) Rs.1.98 lakhs for maintenance renewals of rails and sleepers on the Bombay Port Trust Railway during 1929-30; (2) Rs.25,661 for the construction of an additional railway siding and platform at Ballard Pier Station necessitated by the increased traffic in the busy season.

ADDITIONAL PILOT FOR BOMBAY.

In view of the increase in the pilotage and transporting work, the Board of Trustees of the Bombay Port has sanctioned the creation of one additional appointment of pilot, increasing the cadre to two Master Pilots and fifteen running pilots.

COLOMBO HARBOUR DREDGING.

During the month of June the dredger " Sir William Mathews " was engaged in dredging the 33-ft. area shoreward of Berth No. 1 S.W., and in deepening small ships Berth No. 5 to the required depth of 18-ft. During the month a total quantity of 24,050 cubic yards of dredged material was removed and deposited at sea. The dredger " Sir John Coode " was laid up during the whole of the month.

PILOTS NIGHT FEES.

The Ceylon Government has approved the following new system of payment of night fees to pilots: Night fees (Rs.20) to be paid by the agents in respect of any ship, other than men-of-war and vessels not employing a pilot, passing through either entrance inward or outward between 6 p.m. and 6 a.m. Time to be taken by the signaller of the watch at the pilot station. A list of ships, for which night fees are to be paid, to be forwarded to the respective agents, daily, by the Master Attendant. This new system is to be given a trial for three months ending October, 1929.

NEW SHIPPING COMPANY'S VENTURE.

The newly-former Bengal Burma Steam Navigation Company have taken over the management of the steamer service between Chittagong and Mongdow (Aracanbordor) via Cox's Bazaar from Messrs. Turner Morrison and Co., who were in charge of the line for about fifty years as the managing agents of the Retriever Flotilla Company, Ltd. It is understood that the latter have entered into an agreement not to ply, whether directly or indirectly, any steamer along this route.

The Bengal Burma Company have also recently purchased for Rs.3½ lakhs a big ship named " Englishthan " for carrying on the existing competition with the B.I.S.N. Company about carrying passengers between Chittagong and Rangoon and the coastal ports of India.

HARBOUR LANDMARK DISAPPEARS.

The one-time convict ship, which was for many years a familiar sight in the Colombo Harbour as the police hulk, has been sold, and in a few days will be seen no more in the Colombo Harbour. To everyone who visited the harbour the hulk stood out prominently as the headquarters of the Colombo Harbour Police. It is now being broken up, and in a few days there will be no signs of the existence of the " flagship " of Inspector Ashton, as it is called. The fate decided on for the hulk was that she should be filled with sand and towed far out to sea, forming a target for practice firing by the Ceylon Garrison Artillery. But later the authorities decided to sell her, and tenders were called for. Her purchaser has decided to break her up and rebuild a small vessel with her fittings for his own use. In her seaworthy days, before she became the headquarters of the harbour police, the hulk was used as a convict ship and carried criminals from Ceylon to the Andaman Islands.

HOW TO MAKE CALCUTTA PORT REMUNERATIVE.

" It is commercially possible to keep the Port of Calcutta open for Haji pilgrims provided sufficient amount of publicity work is done." This is the emphatic opinion of Khan Bahadur Azizul Haq, who gave evidence before the Haj Enquiry Committee in Calcutta. The Khan Bahadur said that he had consulted a large number of Hajis, who stated that they would very much prefer to sail from Calcutta if they could get proper facilities. He also suggested that though the running of ships to the Hajaz should ordinarily be on business principles, the Government of India, however, should look upon the pilgrim traffic in a slightly different way. He did not consider it desirable to close the Bombay Port and divert the traffic to Calcutta entirely. He suggested that it would be possible to fill a pilgrim ship sailing from Calcutta in the middle of " Ramzan." Witness cited many instances as to why ships starting from Calcutta ought to be remunerative to shipping companies. He agreed that it would be reasonable to Bengal pilgrims going to Bombay without passes a fee of Rs.10 per head, and those going to Calcutta from their districts without passes a fee of Rs.5 per head.

COLOMBO'S NEW CUSTOMS HOUSE.

A thing that strikes one rather forcibly when one gets some distance out in the Colombo Harbour is the insignificance of Colombo's new Customs House when looked at from the sea. That is a pity, indeed, and I do not think the architects who planned it were aware of the fact that the Customs House, seen from the sea, could hardly be recognised as such, it being completely eclipsed by the Grand Oriental Hotel, Mackinnon Mackenzie's and Gaffoor Buildings. The effect is far from flattering to the harbour or to the city.

This anomaly would perhaps never have been possible if the city was laid out according to the town planning scheme, since under such conditions the Customs House would have been one of the most imposing buildings in the city, seen either from the land or from the sea, and would have added considerably to the prestige of the port.

BOMBAY PORT MATTERS.

In reply to a reference from the Government of Bombay, regarding the compulsory testing of stevedores' chain slings as a precaution against accidents to dock workers, the Trustees of the Bombay Port have expressed their willingness, at a meeting held recently, to undertake the work, subject to a revision of the testing charges necessary to cover the additional outlay and an amendment of the Docks By-laws to provide for compulsory periodical testing and annealing of stevedores' chain slings.

At the same meeting an amendment of the Bombay Port Trust Railway Goods Tariff was also sanctioned in regard to freight charges on scrap iron, providing that, in future, subject to the maximum loads of 23 tons and 46 tons respectively, allowable for four-wheeled and bogie wagons, any excess in a consignment up to 10 tons will be charged at the rate of Re. 1 per ton; and excess over 10 tons and up to 20 tons will be charged as for one extra wagon.

BOMBAY PORT EXPENDITURE.

Among estimates of expenditure of the Bombay Port which were considered early this month and were eventually sanctioned, include the following items: (1) Rs.1,42,982 (to be met from the Vessels Replacement Fund) for the purchase of a new motor lifeboat to replace the steam launch "Siren," which was built in 1890. The new craft will be used as a seagoing tender and will also provide a means of rendering life-saving service, for which no provision has existed in Bombay since the abolition of the lifeboat stations at Alibag and Colaba. The hull of the vessel will be constructed by Messrs. J. Samuel White and Co., of Cowes, who submitted the lowest tender, and the engines and machinery will be supplied and installed under the provision of the Royal National Lifeboat Institution; (2) Rs. 28,235 for bracing columns and trusses and strengthening foundations of "B" Grain Depot.

PUBLICITY BUREAU AT COLOMBO CUSTOMS.

It will come as a surprise to many that the proposed General Information Bureau at the new Colombo Customs House is, after all, to be abandoned. The Port Commission at its last meeting considered a precis of replies received from the Ceylon Chamber of Commerce, Shipping Companies, hotels and others interested in the tourist trade, to the circular issued by the secretary of the Colombo Port Commission, with regard to the possibility of the formation of a Publicity Association by private enterprise, together with semi-official correspondence with the Director of Statistics. The Commission saw no prospect of the proposed Publicity Association being run by private enterprise, and saw no justification at the present time for the establishment of a Government bureau. The advantages which would accrue to the Colony from such an institution would not be commensurate with the expense entailed, it holds.

CEYLON CHAMBER OF COMMERCE AND THE PROPOSED PORT TRUST FOR COLOMBO.

An extraordinary general meeting of the Ceylon Chamber of Commerce was held last month in Colombo to consider the question of the establishment of a Port Trust in Colombo. Mr. M. J. Cary, who presided, in the course of his address said that in view of a certain amount of misunderstanding which appeared prevalent he desired to emphasise that the Chamber claimed no exclusive concern in the administration of the port; it was a matter of general concern. The Chamber was interested as primarily representing the trade of the island, but it was the public that was ultimately interested in the efficient management of the port, which was the common concern of all and not of one community.

Practical experience peculiarly fitted members of the Chamber to criticise helpfully the working of the port, and the Chamber had a duty to perform in advising what was necessary for the more efficient and economical administration of the port. Inefficient management or lack of foresight in administration would affect the Shipping Companies and merchants in the first place, but it would also affect the island generally, and an increase to port or landing charges would add to the cost of produce exported and to the cost of imports, whether foods or materials.

THE DONOUGHMORE REPORT.

In the Donoughmore Report the harbour was placed under a Minister together with the railway, and the post and telegraphs. An able man would, however, be appointed to that very important portfolio, but it would necessarily take him some little time before he would be able to get a comprehensive grasp of the routine of the administration and financial requirements of the port.

The life of an administration was fixed at a maximum of five years, but as a Minister had to work in conjunction his life would be short, but not a happy, one. If added to past experience of the advantages of frequent changes of a Government Chairman of the Port Commission they were to add a new experience of frequent changes of Ministers. Was it any wonder that those intimately connected with the working of the port, and thereby best qualified to understand its needs, should feel urged to try and devise means of control that would obviate periods of stagnation now caused by frequent changes of the Chief Administrative officer, which it seemed inevitable would be increased, rather than diminished, under the proposed alterations to the Constitution?

The administration of the port, like the administration of the railway, was not a political matter, and it should be kept outside the sphere of politics. The port needed at its hand a whole-time officer able to devote time and thought to its present working, its future development, and, regarding such officer's continuity in office, should be dependent upon the efficient performance of his important duties, and not upon his personal popularity with one political body or section of the community. He should be the equivalent in Ceylon of what was called specifically the Permanent Under Secretary of big State Department in England.

A WRONG PRINCIPLE.

It should be an essential principle that the port should not be looked upon as an agency for raising revenue, but should be regarded as an agency which had assisted largely in the development of the economic resources of the country and would continue to do so. The Government point of view, however, had been that the port was merely one of many departments whose receipts and payments formed part of the general revenue and expenditure of the Colony as a whole.

THE PORT AND THE BUDGET.

Dealing with the Budget, Mr. Cary said it was conceivable that a falling off in the general revenue might, in the future, as it had been in the past, necessitate a severe reduction of departmental estimates. The revenue of the port itself might be well maintained, but even if it shared in a general trade depression it should be in a position from Reserves to sur funds for its own needs, because it would be unsound finance to cut down the expenditure.

It had been urged, continued Mr. Cary, that the present was an inopportune time to press for any change, but he submitted that to wait deliberately for a favourable time would savour of opportunism. Changes were pending in the near future in regard to the Constitution and administration of Ceylon. Was not, therefore, the present a correct time once again to raise the question of the relationship of the port with the Government? The formation of a Port Trust for Colombo had been before the Government for the last 25 years. It was nothing new which was being brought up at the present day.

The following resolutions were then proposed on behalf of the Committee of the Chamber of Commerce by the chairman, and were duly adopted:—

(a) "That this meeting considers that to secure more efficient management and development of the Port of Colombo, it is desirable that the management of the port should be vested in a Port Trust on lines similar to those established in India."

(b) "That the meeting authorises its committee to take such steps along the line of the report of the committee appointed to consider the possibilities and advantages of a Port Trust for the Port of Colombo, as they may consider necessary by way of negotiation with Government to give effect to the above resolution, and to report to a general meeting of this Chamber."

GALLE HARBOUR.

A sum of Rs.28,000 has been sanctioned by the Ceylon Government to complete the survey of the Galle Harbour, and Rs.40,000 for the improvement of coast lighting.

RANGOON PORT COMMISSIONERS TO RAISE LOAN.

The Commissioners of the Port of Rangoon have been authorised to raise a loan of 50 lakhs of rupees bearing interest at five per cent. repayable in thirty years.

PERSONAL.

Mr. S. S. Bajpai has been appointed Assistant Collector of Imperial Customs, India.

His Excellency the Governor has been pleased to reappoint the Hon. Mr. C. H. Z. Fernando to be an Unofficial Member of the Colombo Port Commission for the period ending September 10th, 1928.

Port of Southampton Topics.

AUGUST FIGURES PROVE A RECORD.

The August figures published by the Southern Railway Company in respect of Southampton Docks have been received with great gratification in the port, for the tonnage figures as well as the number of passengers constitute a record for any one month in the whole history of the port.

There was an increase of 48 ships both in and out compared with the number in the corresponding month last year, the inward total being 408 and the outward 410. The gross tonnage inward was 1,960,803, an increase of 163,609 tons, while outward the figures were even more impressive, the total for August this year eclipsing that for the corresponding month last year by 279,963 tons, the total for August this year being 2,009,802. The net totals were also highly satisfactory, the increase inward being 97,979 tons, and outward 167,628 tons. These figures resulted from the inward total rising to 1,038,804 tons, and the outward to 1,068,023 tons.

The fact that the passenger totals rose so appreciably gives particular satisfaction, for Southampton is very keen on preserving her title of premier passenger port in the United Kingdom. The net increase inward and outward amounted to nearly 15,000, of which 6,901 were accounted for inward and 7,764 outward. The actual totals were inward 50,959, and outward 66,297.

The most surprising side to this increased passenger activity is that which has taken place in regard to the inward total. The only explanation can be that the American invasion of Europe must be extending over a longer period than has been the case in previous years.

Cargo returns were also eminently satisfactory, for there was an increase of 3,791 tons inward and 4,810 outward, indicating the steady expansion of the cargo trade of the port. The totals were 55,894 tons inward and 52,708 tons outward.

The new record with regard to tonnage totals through the docks reflects great credit on Captain E. W. Harvey, M.B.E., the Dockmaster and Outdoor Assistant, in dealing with the traffic with the limited accommodation at his disposal. The existing docks were not built for the handling of anything like the tonnage that now pours into them, and it is stated that there is 40 per cent. more shipping using the port than was thought possible in 1919. The Dockmaster's task, however, will soon be simplified to some extent, for the first of the quays to be provided under the £13,000,000 extension scheme on the Western Shore should be available within two years.

BIG RUSH OF HOME-GOING TOURISTS.

The past month has been one of the greatest rush periods that Southampton Docks has experienced for a long time, though the autumn is always a busy time. Both the big and the small liners have all been booked to capacity with homeward-going Americans and Canadians, and most of the shipping companies have had long waiting lists of passengers ready to take any vacancies that occur. A foreign liner cleared from Southampton the other day with the commander, the purser, the wireless operator and several stewards and stewardesses having given up their regular quarters in favour of passengers who were particularly anxious to get home.

When the rush season is over the big liners will undergo their annual overhauls. This big job brings work annually to thousands of ship-repairing hands at Southampton, and it is gratifying from that point of view that the prospects of winter employment are as promising this year as in the past. The first of the "big six" to go into dock will be the "Aquitania," which will be off the service undergoing overhaul from November 19th to January 8th, while the "Homeric's" period of overhaul is from December 7th to January 15th. The "Majestic" will lay up for two months, from December 11th to February 12th, as there is a large amount of work to be done on her. It is estimated that about 1,000 men will be afforded continuous employment for the whole of the eight weeks that she will be moored to the quayside in the Ocean Dock. The "Mauretania" will not require so long a period in dock as was the case last winter and her overhaul period will occupy only a day or two over a month from January 2nd to February 5th. Last winter, of course, additions were made in her engine room during her laying up, and it was in consequence of these that the 22-year old vessel was able to break her own records this year on the Atlantic crossing. The "Berengaria" will be in dock from January 10th to February 26th, and the "Olympic" from January 7th to February 19th.

In addition to the "big six" the three Canadian Pacific Empresses, "The Empress of Australia," "The Empress of France" and "The Empress of Scotland," will require attention. The overhaul of the "Empress of Australia" will be undertaken early in time to allow her to leave Southampton on November 14th for her 163 days' world cruise, on which she will cover 37,046 miles before returning on April 26th. "The Empress of France" is likely to have a considerable amount of work done after her 12 months' spell in the Pacific, where she has relieved the "Empress of Canada," which has returned to this country to have new engines installed. The "Empress of Scotland" will be prepared for a cruise during her lay-up, as will the "Homeric" and the "Mauretania," both of which will make a trip to the Mediterranean.

As in former years the Red Star Liner "Belgenland" will be dry docked at Southampton for overhaul prior to her world cruise.

While the dry-dockings are taking place and the White Star Liner "Homeric" and the Cunarder "Mauretania" are cruising in the Mediterranean this winter the joint service by the White Star and Cunard Companies will again come into operation. The idea was introduced a few winters ago. It is difficult to maintain two express services across the Atlantic in the winter for there is at least one ship of each company off service throughout the period, apart from which the number of people travelling is insufficient to justify competition between the two big companies concerned.

When the arrangement takes effect the Cunard Line will change their sailing day from Saturday to Wednesday. The "Berengaria" will be the first Cunarder to take a Wednesday sailing, on December 4th, and the scheme will operate until March 12th, when the departure of the "Aquitania" for New York will bring it to a close.

TROOPING SEASON STARTS.

The trooping season began at Southampton on September 11th and throughout the winter until the end of April Southampton Docks will regularly be the scene of military activity, for the port is now the principal embarkation point for troops for India and the East. The Transport City of Marseilles, which left on the 11th, took troops for the West Indies and China, and the voyage will be by way of the Panama Canal and Honolulu. The vessel will make a world trip before returning to Southampton with homeward-bound troops from China on December 27th.

HEAVY BOOKINGS FOR NEW ZEALAND.

Indications are that the new passenger service to New Zealand will reach big figures. The New Zealand Shipping Company have had heavy bookings, and the "Ruapehu," which opened the season when she sailed from Southampton on September 13th, had all her cabin accommodation taken. The "Rangitiki," which sailed later in the month, was also fully booked. This vessel was the first of the three motor passenger liners ordered by the New Zealand Company. The "Rangitata," the second of the trio, will make her maiden voyage from Southampton in November, and the "Rangitane" will follow a month later. The company are contemplating placing orders for three large motor ships to cope with the increasing cargo traffic between this country and New Zealand.

WELL-KNOWN SURGEON RETIRES.

Dr. B. Sydney Jones, Surgeon on the Cunard Liner "Aquitania" and one of the most popular medical practitioners on the Atlantic retired after a period of service extending over 36 years when the liner docked at Southampton on September 17th. Since 1919 Dr. Jones has been with the "Aquitania," and he has been in the service of the Cunard Line for 33 years. Dr. Jones crossed the Atlantic nearly 800 times and covered about two-and-a-half million miles. During the war Dr. Jones served with the Royal Navy and with the Royal Air Force.

Dr. Jones is an authority on sea-sickness and his advice to sufferers is to avoid any acid diet for a week before sailing, and to live as far as possible on such things as lamb, mutton, chicken, grape fruit, oranges, vegetables and white fish. When sea-sickness does occur Dr. Jones advises liberal doses of citrate of soda.

As a token of the regard of the officers and crew of the "Aquitania" Dr. Jones was presented with a handsome silver salver and silver coffee service during his last voyage.

NEW ORIENT LINER "ORONTES" VISITS SOUTHAMPTON.

The new 20,000-ton Orient Liner "Orontes" was much admired when she visited Southampton after her short Channel cruise recently. She left about the middle of September for a cruise to the Mediterranean and Adriatic and will return to London to make her maiden voyage to Australia, for which route she is designed, on October 26th. The "Orontes" has accommodation for 500 first-class and 1,100 third-class passengers, and the comfort and convenience of passengers has been carefully studied in the designs of the vessel. The "Orontes" acted as a grandstand for spectators to view the Schneider Trophy race on September 7th.

NEW GRAIN CONVEYOR FOR SAINT JOHN, NEW BRUNSWICK.

The Saint John Harbour Commission has awarded a contract to the McDonald Engineering Company, of Toronto, for the construction of a grain conveyor gallery to serve No. 7 berth at West Saint John. The new conveyor, which will cost $120,000, will be 1,100-ft. long and will enable grain to be loaded at any of the west-side berths. The construction work is expected to take about three months.

Events at Hull.

The effects of the disastrous fire which completely destroyed the new Iceland fish market at the St. Andrew's Dock, Hull, within a few days of its completion have been minimised by clearing a considerable portion of the stage of the tangled steel work and debris, but the trade must continue to be seriously hampered for some time. All the offices on the upper floor of the stage were destroyed, together with their contents. It is intended to rebuild the market on the existing plans, but before anything definite can be done the damage to the piling has first to be ascertained. In any event, restoration will be a very costly undertaking, since the market, so far as it had been completed, had involved the Railway Company in an expenditure of approximately £100,000. It will take not far short of this to rebuild the structure, so unexpectedly and thoroughly was it destroyed by the flames.

Representatives of the Norwegian Government and the Norwegian fishing industry, who have visited various ports of the United Kingdom, included Hull in their itinerary and were given a very cordial reception by the civic and commercial authorities. Hull does a very considerable trade with Norway, and imports large quantities of Norwegian-caught herrings for the purposes of the curing industry. Norway is seeking to extend her exports of fish, and an endeavour is being made to find an outlet in the English market. The delegates were greatly interested in the up-to-date facilities of the port and visited also various local factories, including those devoted to the manufacture of ice, fish meal and the curing of fish.

The delegation included Mr. F. Oftedal (Minister of Commerce); Mr. M. N. Foshaug, M.P. (chairman); Mr. J. R. Aas, M.P. (vice-chairman); Mr. O. H. Langhammer, M.P. (secretary), of the Committee for Communications; Mr. J. J. Caroliussen, M.P., Mr. G. J. Eiesland, M.P., Mr. Erik Enge, M.P., Mr. Olav Oksvik, M.P., Rev. O. K. Steinholdt, M.P., Mr. L. Tvedt, M.P., Mr. O. A. Versto, M.P. (members); Mr. A. K. Hillestad, Mr. J. T. Semmerschild (permanent under-secretaries, Ministry of Commerce); Mr. S. K. Asserson (Director of Fisheries); Mr. O. T. Bjanes (Director of Agriculture); and others.

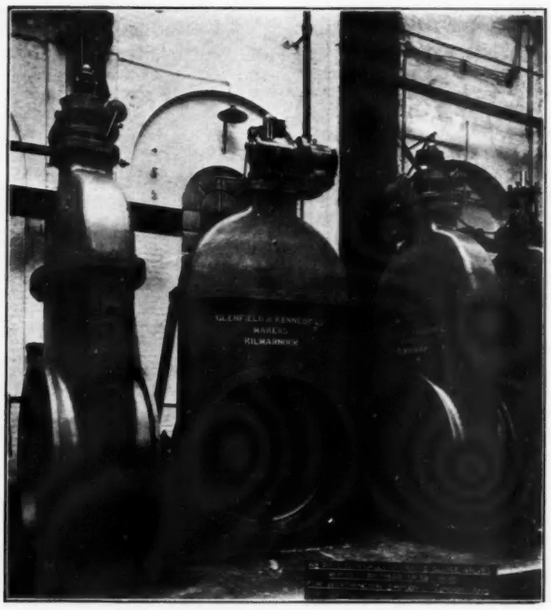
Hull is to have a Civic and Empire Week commencing 10th October, which will be inaugurated by H.R.H. Prince George, when he will visit the new municipal aerodrome and formally inaugurate Hull an air-port. One of the principal events will be an air pageant, including a display by the famous No. 29 Squadron of the Royal Air Force, and later by Captain Neville Stack and pilots of the National Flying Services. Unanticipated difficulties arose to the granting of a certificate to the new aerodrome owing to its being discovered that a site in close proximity had been secured for a gas works. The Hull Corporation have, however, been able to provide an alternative site by mutual arrangement with the East Hull Gas Company; so all is well.

The proposal to purchase the old Queen's Dock and utilise the space for an ornamental square and improve road connections with the Old Town has been advanced a further stage. Informal discussions have taken place between the chairman and other members of the Hull Corporation and representatives of the owners of the dock, the London and North-Eastern Railway Company. The outcome has been reported to the full committee, who passed a resolution approving generally of the statement of the chairman and the negotiations which have already taken place, but also stating that before coming to a final decision in the matter they desire to have an interview with the Divisional General Manager of the L.N.E.R. Co. at an early date.

The import trade at Hull docks so far this year has failed in one or two particulars to come up to the level of 1928. To the end of August, according to the returns of the Hull Incorporated Chamber of Commerce and Shipping, the imports of wheat and kindred cereals were 766,000 tons against 809,000 tons in the corresponding eight months of last year, while the arrivals of oilseeds, etc., were 472,300 tons against 497,780 tons, a decline of 25,480 tons. On the other hand, imports of timber at 592,000 loads compared with 510,000 loads, an increase of 81,000 loads. Thanks to the improved arrangements made by the L.N.E.R. Co. at the docks devoted to the timber trade, there has been very little congestion, and the increased arrivals have been handled expeditiously, a considerable proportion being railed inland ex-ship or ex-quay. A feature this year has been the preponderance of Russian cargoes of sawn wood, of which Humber importers have bought freely to the exclusion to some extent of Swedish wood. Trade of late has, however, been seriously handicapped by a scarcity of tonnage and a consequent rise in freight rates. The export of coal fell off somewhat in August from the high level of July and preceding month. The exports (foreign) from the Humber ports in August (four weeks) were 484,596 tons, bringing the total from January 1st to date up to 4,036,715 tons. This is a very substantial advance on last year and is due in the main to the efforts made by the Yorkshire and Midlands Coal Marketing Committee to expand the trade in Yorkshire coal abroad.

Electrically Operated Sluice Valves.

Progress is now being made in many fields with " distance " electrically operated sluice valves, both for water and steam, with control from any conveniently situated switchboard, which is of particular value for dock and harbour work. As typical of the latest modern practice we are able to reproduce a photograph of three large-diameter, self-contained, electrically operated sluice valves, designed for remote control, recently supplied by Messrs. Glenfield and Kennedy, Ltd., of Kilmarnock, through Messrs. Worthington Simpson, Ltd., for the Port of London Authority. These units are in use at the Surrey Docks, being 68-in. diameter and working under a head of 15-20 feet, the valves being operated by small A.C. electric motors, driving the screwed spindle through spur and worm reduction gears, all neatly mounted on a headstock bolted to the valve cover. Current for the motors is controlled by a set of push button switches, the installation including circuit breaker and reversing controller, the valve being automatically stopped at the extreme position of its travel by either one or other of the limit switches that are situated on the indicator hood and operated by the pointer. Provision is also made for hand operation by means of a crank handle in the event of the failure of the electric supply.



68-in. sdiameter Electrically Operated Sluice Valves for Port of London Authority Surrey Docks.

The methods of valve construction follow the firm's usual practice, the body, dome, and door being of the finest grey cast iron moulded in dry sand, which produces a very smooth finish. Heavy gunmetal faces are fitted to the valve body and door, being securely held in position by screwed brass pins and hand scraped to form a perfectly watertight joint, while the operating screw is accurately machined from a forging of high tensile manganese bronze, working in a gunmetal nut secured to the valve door.

Great attention has been paid to lubrication of all the bearing surfaces, the worm reduction gear being housed in a totally enclosed cast-iron casing which contains an oil bath, while lubricators are provided for all the headstock bearings, the thrust collar of the operating screw has a Stauffer grease lubricator, and the ball thrust washers fitted to each end of the worm shaft are packed with grease. These features are the standard practice of Glenfield and Kennedy for all worm-gear operated valves, resulting in a highly efficient drive which requires only a small amount of power for operation and a minimum of attention for long periods.

Further, the valves are manufactured in all sizes up to 108-in. diameter, and for any desired head, 800-feet or over, those for the higher pressures being constructed with cylindrical bodies, and, as indicated, they are equally suitable for controlling water systems and exhaust, low, and high pressure steam.

MEMORANDUM FOR BUSINESS VISITORS TO CANADA

His Majesty's Senior Trade Commissioner in Canada (Mr. F. W. Field) has prepared a " Memorandum for the Use of Business Visitors to Canada." It is in the form of a booklet of 37 pages, and deals with those subjects, a knowledge of which is likely to be of value to a traveller, especially one making a first visit.

Copies of the Memorandum can be obtained on application to the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1 (the reference No. C.X.3125 should be quoted).

Commerce at Italian Ports.

Since Admiral Ciano, Count of Cortellazzo, and Minister of Communications, announced about two years ago that the free port regime would be extended to the chief Italian harbours with the object of developing Central European transit trade through the most important North Italian Harbours, the problem has been one of the chief items of discussion.

However, before going into the details of the question, it is worth while examining the following statistics concerning the development of trade at Italian ports during the past few years, and during the first two quarters of 1929:—

	ARRIVALS. January to June.		CLEARANCES. January to June.	
	1929.	1928.	1929.	1928.
No. of Ships:				
Italian ...	88,836	82,371	88,854	82,414
Foreign ...	5,107	5,237	5,106	5,228
	93,943	87,608	93,960	87,642
Net registered tonnage:				
Italian ...	28,591,562	25,821,803	28,199,440	25,801,995
Foreign ...	8,978,339	9,208,726	8,864,924	9,041,548
	37,569,901	35,030,529	37,064,364	34,843,543
Goods (Tons):				
Italian ...	8,526,692	7,739,246	3,344,093	3,191,475
Foreign ...	5,817,399	5,946,284	870,599	764,740
	14,344,091	13,685,530	4,214,692	3,956,215

	Twelve months.	Twelve months.
1928 ...	25,812,681	7,626,076
1927 ...	27,326,838	8,134,836

As can be seen, trade is increasing, and it may be expected that figures will exceed even higher limits than those reached in 1927. The figures show that trade has increased in the first part of the year, so that there is no doubt that shipping at Italian ports at the end of 1929 will exceed that of 1928.

However, to return to the question of transit trade through Italian harbours, one must examine the development of shipping at North Italian ports:—

	Goods unloaded.		Goods loaded.	
	1929.	1928.	1929.	1928.
Genoa (tons) ...	3,591,970	3,500,501	517,119	444,319
Venice ,, ...	1,215,143	1,200,399	196,609	129,182
Trieste ,, ...	1,090,922	870,454	432,984	383,026
Fiume ,, ...	238,962	256,309	165,091	182,704

These figures show a general increase If one examines the details of the various developments it will be noticed that Swiss trade through Genoa, which represents the most important item of transit traffic at the leading Italian port, is showing a tendency to resume the pre-war volume as far as imports from overseas markets to Switzerland via Genoa are concerned, while exports are practically doubled, as follows:—

	Imports to Switzerland. Tons.	Exports from Switzerland. Tons.	Total.
1911 ...	132,169	20,249	152,418
1912 ...	112,671	31,153	143,824
1913 ...	115,170	23,407	138,577
1914 ...	220,652	53,336	273,988
1915 ...	285,783	40,594	326,367
1916 ...	226,116	21,330	247,446
1917 ...	66,806	7,389	74,125
1918 ...	14,979	4,149	19,128
1919 ...	602,104	12,324	614,428
1920 ...	420,440	27,184	447,624
1921 ...	151,843	21,584	173,427
1922 ...	169,017	18,894	187,911
1923 ...	232,270	29,623	261,902
1924 ...	201,193	30,033	321,228
1925 ...	173,741	37,500	211,241
1926 ...	156,619	46,604	203,223
1927 ...	128,519	50,114	178,633
1928 ...	116,770	52,077	168,847
1929 (six months)	49,493	22,537	72,030

This fact has attracted the attention of the Italian Authorities and business circles and several Swiss exporters have been put into direct connection, after some meetings held for this purpose, with the representatives of Italian freight-forwarding firms, and steamship owners in order to ascertain the requirements of this trade. It is stated that what influences the development of the imports is more the maritime freight rates than railway tariffs or unloading expenses. In this connection it is stated that goods are bought c.i.f. European harbours so that Swiss importers have little influence in regard to the choice of the port of transit and arrangements are made most likely in the country of origin. It is thought, however, that these developments depend upon the choice of the country where Switzerland is buying or selling, and the choice depends from the various fluctuations of the markets, although it is certain that tramps from North or South America prefer to unload at Antwerp or Rotterdam in view of the fact that from these ports it is much easier to reach British coal ports to find outward cargo, and that there is no doubt that certain goods such as coal or wheat are much better when subjected to river rather than to railway carriage.

These circumstances in connection with the influence of maritime freight rates are confirmed by the fact that, taking, for example, the North European route, more imports into Italy are made in foreign ships than with Italian ships, as is shown by the following figures:—

Tons of goods carried January—June, 1929.

To and from	Italian ships.	Foreign ships.
Italian ports	4,880,707	106,362
Mediterranean	1,611,653	355,085
Black Sea	645,119	202,237
North Europe	2,575,073	4,268,769
West Africa	117,385	43,231
North America	916,392	378,697
Central and South America ...	634,761	776,864
India and Far East	454,815	282,206
Australia	24,589	134,847

On the other hand, there is no doubt that Signor Ciano will have been right when he has made arrangements to increase the development of the power of Italian markets, as it is certain that if the commercial organisation of each port is such that commission houses are purchasing on overseas markets not only for their home requirements, but also for the hinterland, or for zones which are likely to be attracted towards the port itself, the influence of foreign exporters in regard to the booking of tonnage for a certain port or for another has little influence, and this is confirmed particularly by the development of the tobacco trade in the free port of Trieste where several factories have been built up, by the development of the industries in the Marghera Docks at Venice, etc., which are attracting the attention of the countries of the hinterland towards these harbours. Unhappily this necessity is not always felt as it can be seen from the fact that the Italian Government has imposed the embargo on the transit of foreign fruits, and there is no doubt that Italy could become the most important centre for distribution of South African fresh fruits, taking into consideration that oranges, for example, are growing in this country when the crop is over in the Union of South Africa and vice versa. There is no wonder if in this way Italian trade itself has been damaged as it is certain that Central European fruit dealers have deserted these markets where they can buy only a quality of fruits and have gone on the North European markets where they can find Italian, Canadian and South African fruits at once.

However, there is no doubt that also railway tariffs are having a certain influence and this can be seen from the fact that rates from Overseas to Zurich via Hamburg and Waldshut for a 15-ton car of raw cotton and wheat costs 117.33 lire per cental, whereas the same transport via Kaldenkirchen and Waldshut costs 160.30 lire for raw cotton, and 134.18 for wheat, and about 200 lire via Venice.

In this respect an important influence is caused by the policy of the Swiss Railways Administration which has decided that the tariffs on the route from the Austro-Swiss to the Italo-Swiss frontier should not exceed the cost of the carriage from Venice to the Italo-Austrian frontier at the Brennero, and this in order to avoid that the trade which now employs the Chiasso transit should be diverted on the Austro-Italian route.

This has led to rather hard competition between Genoa and Venice with a certain advantage to the Adriatic port in the cotton trade owing to the excellent facilities which have been built in the course of the past few years and including two new concrete warehouses, with up-to-date electric cranes, etc., enabling the discharge of raw cotton at 11 lire per ton. So that there is no wonder if during 1928 while 10,000 tons of cotton have been imported through Venice to Switzerland, only 6,690 tons have been imported through Genoa.

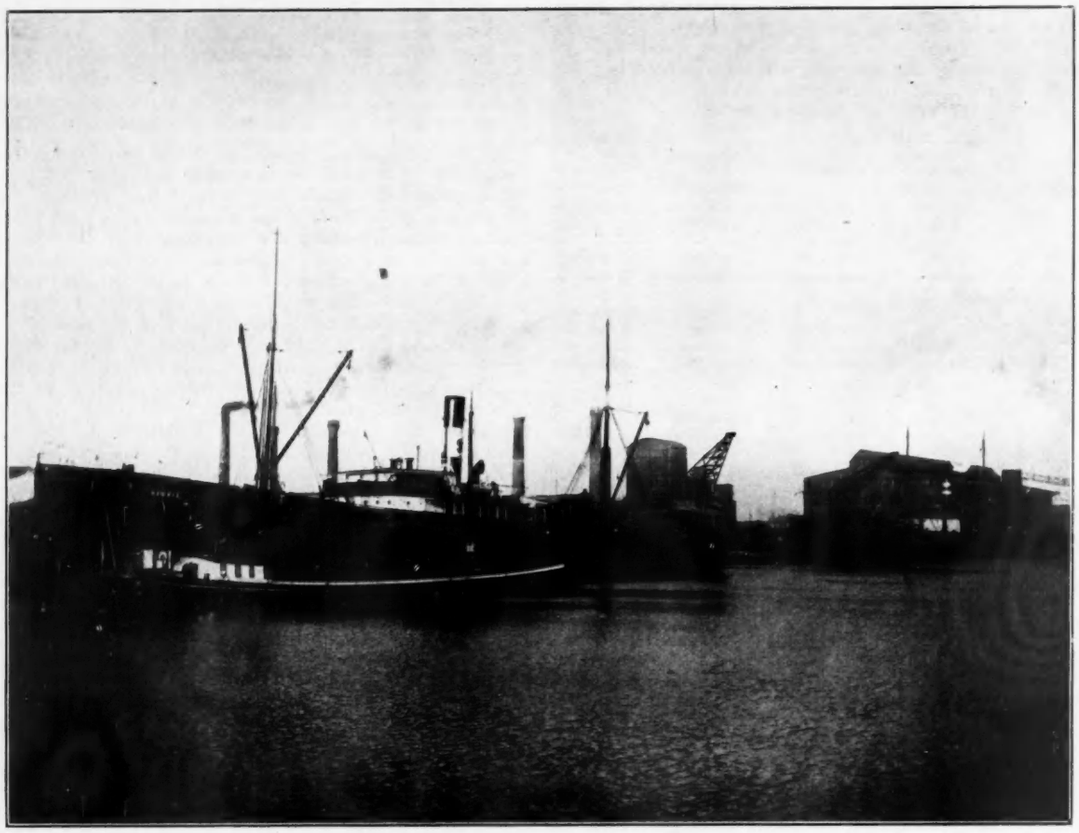
In the case of Genoa, however, the influence of the French railway policy viewing the attraction of shipping towards Marseilles, should also be noted.

However, there is no doubt that much has been obtained at Genoa through the increase of harbour facilities.

Services have been improved and the cost of port operations has declined by about 30-40 per cent. The Bacino Vittorio Emanuele III. Dock is practically finished and the Bacino Benito Mussolini Dock is making good progress. The former has quays with a total length of 2,100 metres, 40 electric elevators able to discharge about 2,000 tons of coal per hour and can accommodate 15 ships. New warehouses have been built and others enlarged. The number of cranes has been increased to 124, of which 19 are large electric elevators.

The position of Trieste is rather more difficult owing to the fact that the hinterland of this harbour consists of countries where economics have been so much upset by the Great War that it is rather impossible that their foreign trade is not subject to fluctuations, nor must it be forgotten that the Near East, which used to be a very important asset of Trieste, has now become independent and has direct connections with overseas ports as can be noticed from the fact that a Japanese steamship service has been started between Stamboul and Moji. The Italian authorities themselves have realised the situation as can be noticed from the fact that an industrial zone has been created at Trieste and plans are being worked out to organise the distribution of Brazilian coffee to Central Europe and the Balkans from Trieste where an important coffee market should be instituted with the participation of Brazilian interests.

Ports of Bruges and Zeebrugge.



Factories in front of Sea Canal near Zeebrugge.

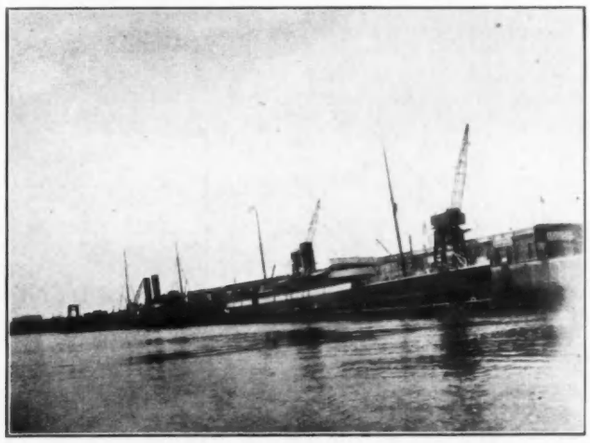
Vessels sheltering in Zeebrugge roadstead during storm, February 1929.

Ports of Bruges and Zeebrugge.

HISTORICAL.

SEVEN MILES DISTANT from the shores of the North Sea, Bruges occupied the premier position among the ports of North-Western Europe, during the Middle Ages. In the course of the 15th Century, the " Swyn " an arm of the sea which linked the town with the ocean, began to silt up very rapidly, and the commercial and maritime prosperity of the community gradually declined.

In the year 1895, the Belgian Legislature recognised the advantage that would accrue to the country's trade from the construction of a deep water port on the sea coast and when resolving upon creating Zeebrugge, decided to connect it with Bruges by a ship canal.



Zeebrugge: Quay-side Station with Hull and Harwich steamers alongside.

The complete undertaking, which represents an expenditure of 55 million gold francs, was terminated and inaugurated by King Leopold II. on the 23rd July, 1907.

ZEEBRUGGE.

The constant progress of naval shipbuilding has led to the construction of vessels of ever-increasing size, and as a consequence the shipowners interest is to get the maximum of employment out of his vessels by seeking to eliminate every possible cause of loss of time.

Zeebrugge being situated on the North Sea, in proximity to the Wielingen Channel leading to the Scheldt, is right on the avenue of trade followed by the majority of the great steamship lines, whose vessels can thus call at Zeebrugge without deviating from their route. A specially-built direct railway links Zeebrugge and Bruges, where connection is made with the Belgian and Continental railway systems. Zeebrugge is 5 hours' journey from Paris, 14½ hours from Berlin, 21 hours from Vienna and 13½ hours from Basle.

Zeebrugge is appropriately equipped for its role as a point of exchange for rapid transoceanic traffic, and passengers using the port are only subjected to one transfer from train to boat, the trains running right alongside the liner's berth.

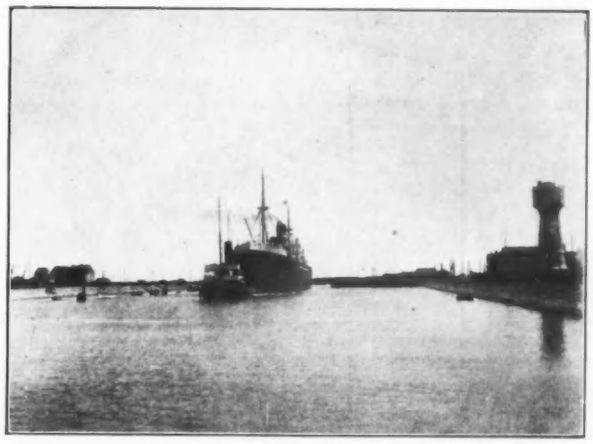
Bruges Harbour: West Dock.

The port of call of Zeebrugge is situated half-way between Ostend and the mouth of the Scheldt. The roadstead is connected with the Wielingen Channel by a dredged channel about 26-ft. in depth at low water.

FACILITIES AND ACCOMMODATION.

This roadstead, about 300 acres in extent, is sheltered by a huge breakwater 8,187-ft. long. The outer breakwater wall is surmounted by a promenade and on its inner side is a platform 242-ft. wide. This platform in turn is bordered by the quay walls affording sheltered accommodation and directly accessible from sea. The quay walls are carried down far enough to enable depths of 34-ft. to be dredged along the 1,478-ft. of quayage at the seaward end of the mole, 29-ft. along the adjacent 1,230-ft. and 26-ft. along the landward end of the mole, for a distance of 2,446-ft. All the depths mentioned correspond to L.W.O.S.T.

The extensive platform between the breakwater and the quays is entirely paved and provided with a complete network



Zeebrugge: Entrance Channel and Sea-lock.

of railway lines as well as three sheds. Particulars of which are as follows:—

Shed No. 1 measuring 492-ft. in length and 49-ft. in breadth.
Shed No. 4 measuring 394-ft. in length and 49-ft. in breadth.
Shed No. 5 measuring 492-ft. in length and 49-ft. in breadth.

Adjoining No. 1 shed is the quayside station, fitted up both for goods and passenger traffic.

Trains for Belgium and the Continent stand under shelter in readiness for the boats.

It is planned to build a similar quayside station at No. 5 Shed when traffic requires.

The equipment comprises ten 4-ton and two 2½-ton electric portal cranes.

To the port of Zeebrugge is attached one floating sheer legs lifting up to 55 tons and also a tug for the assistance of vessels.

The first demonstration of the suitability of Zeebrugge as a port of call for large tonnage was afforded in September, 1914, when 11 steamers arrived within a short space of time, having on board the survivors of the 4th Division of the Belgian Army, who were repatriated through France after the fall of Namur.

Again in October, 1914, and in three days' time, 30 transatlantic liners, including the ss. " Cymric " (8,764 tons net register and drawing 26-ft.), landed at the mole the troops and

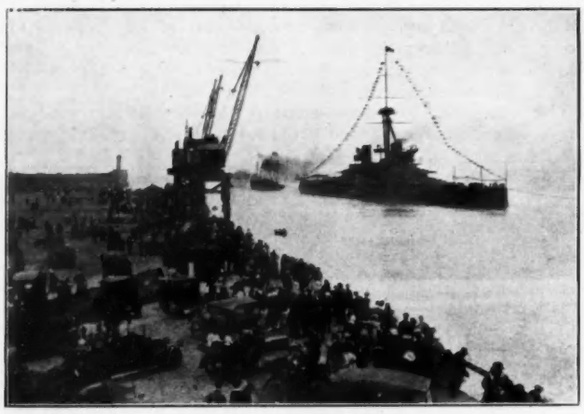
Bruges Harbour: East Dock.

equipment of the 7th Division of the British Expeditionary Force. All these disembarkation operations worked without a hitch, and the facilities of the port for shipping of large size evoked the praise of the British Admiralty Transport Officers.

Several of the steamers involved entered and left or swung in the roadstead, at dead low water.

On the 27th of August, 1920, the Brazilian battle cruiser "Sao Paulo" (19,281 tons net register, drawing 29½-ft.), berthed alongside the mole and sailed on the 1st September, after having embarked the King and Queen of the Belgians proceeding to Brazil.

The evidence afforded by the berthing and the five days' stay of the Brazilian Dreadnought at the breakwater quays is irrefutable and goes to prove that the harbour fully complies with the requirements of deep-draught vessels as planned at its inception.



Brazilian Dreadnought "Sao Paulo" leaving Zeebrugge, 1st October, 1920.

An entrance channel, 348-ft. wide at water level (high water) and 164-ft. wide at bottom level, opens into the roadstead and leads to the sea lock; the depth of this channel is 19-ft. at low water and 34-ft. at high water.

The sea lock connects the outer roadstead and the channel with the inner port and the ship canal to Bruges. Its total length is 840-ft. (518-ft. between the roller gates). The width of the entrance is 65-ft. 8-in. The depth of water on sill at low water is 18-ft. and at high water 34½-ft.

Above the lock is to be found the inner harbour of Zeebrugge, a dock 14 acres in extent, where accommodation can be provided when the time comes for handling cargo.

To the east of the inner harbour exists a basin originally intended for use as a sanitary station, and now available for commercial purposes; here are two wharves, each of 65-ft. 7-in. in length.

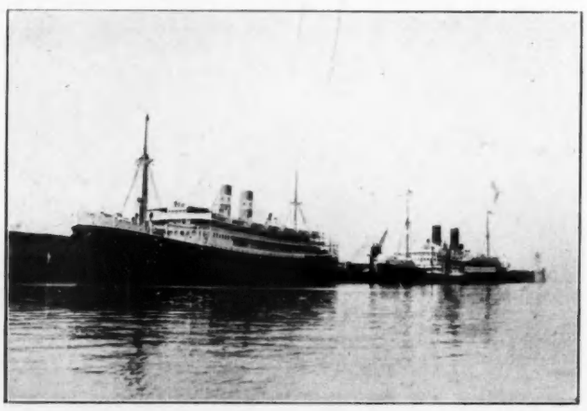
Opposite is the first of the three new basins, 1,449-ft. long, with a width at bottom of 334-ft. and at water level of 478-ft.

This basin contains a wharf provided for vessels carrying oil and other liquids in bulk, which discharge their cargo direct in the tanks close by, as well as the Continental terminal of the Zeebrugge-Harwich train-ferry service.

The depth of water in the inner harbour, the sanitary dock and the new basin is 26-ft. 3-in.

THE SHIP CANAL.

The Ship Canal, 6¼ miles long, leads from the inner harbour at Zeebrugge to the docks at Bruges. Drawn in a perfectly straight line from end to end, it is only crossed by one swing road bridge with a span of 66-ft.



Transoceanic liners, S.S. "Braza" and "Espagne," berthing alongside quays, Zeebrugge Mole.

It is 230-ft. wide at water level and 72-ft. at bottom level, with a depth of 26-ft. 3-in. Its level is maintained from the seaward end by operation of the lock-feeding chambers.

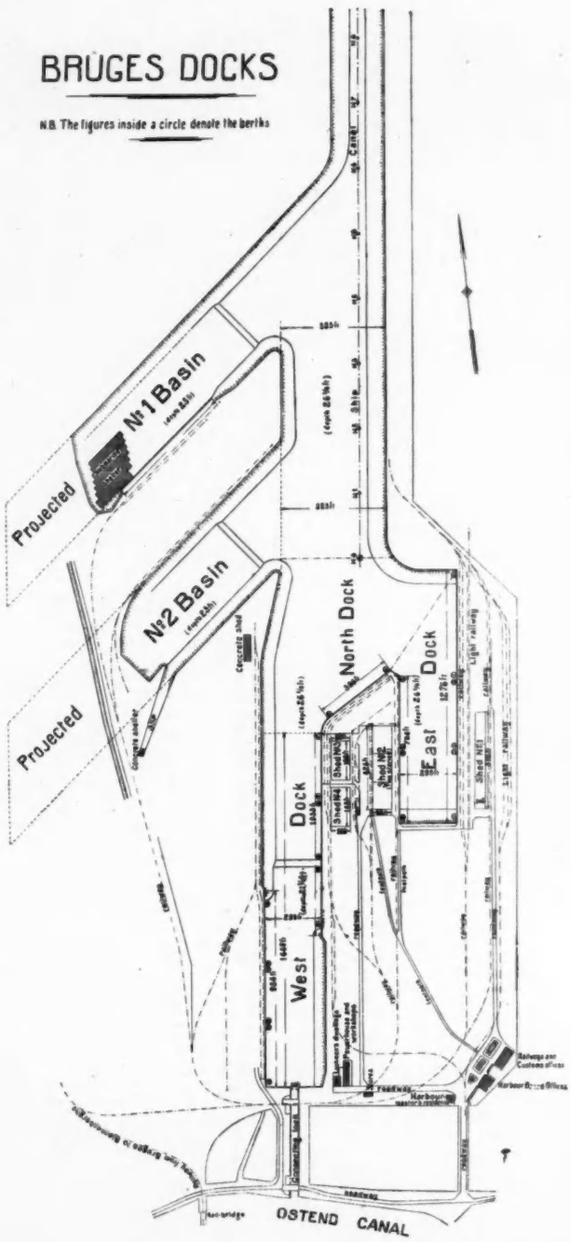
The banks at water level are protected by a rough stone revetment.

The canal has a trade nucleus of its own, several important factories being established on its western bank, viz., the huge coke works, a glass works, an oil refinery, timber saw mills, etc. Extension of industrial activity can be looked forward to as soon as certain difficulties in regard to acquisition of suitable ground space can be overcome.

BRUGES.

Bruges Harbour consists of three fully-equipped basins and two side docks.

The East Dock is 682-ft. 6-in. long, the West Dock, 1,772-ft., their width is 295-ft. 3-in. The North, or Manœuvring Dock, has an average length of 794-ft. and a width of 750-ft. The depth of the three docks is 26-ft. 3-in. with the exception of the southernmost end of West Dock which is only 21-ft. 4-in. deep.



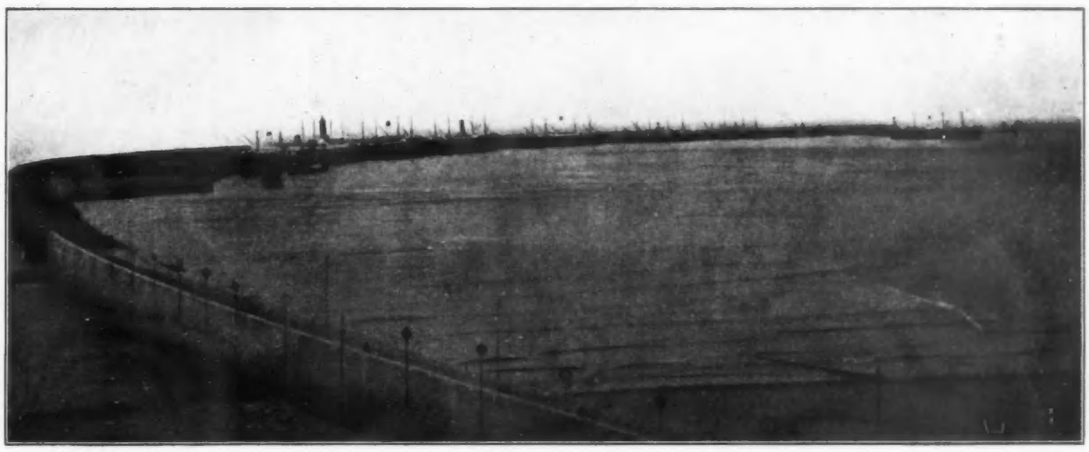
The shed accommodation at Bruges consists of four sheds adjoining the quays and under reach of the cranes. Their available surface is 1,143,550 sq. ft.

The equipment of Bruges New Docks consists of 17 electric 2½-ton and four 2-ton cranes, besides six 7-ton electric cranes are owned by a private concern.

The two side docks branch off on the western bank of the Ship Canal, just north of the Bruges end of the Ship Canal. Their total water area is over 20 acres, and their depth is approximately 20-ft. They are still unprovided with quayage and discharging appliances.

As regards trade with England more especially, Bruges is an eminently suitable port for large cargo carriers; boats trading to and from England will find the port to be most readily accessible thus ensuring to owners an economical and constant employment of their tonnage.

Ports of Bruges and Zeebrugge.



Disembarkation of 7th Division British Expeditionary Force, October 1914.

Disembarkation of 4th Division Belgian Army, September 1914.

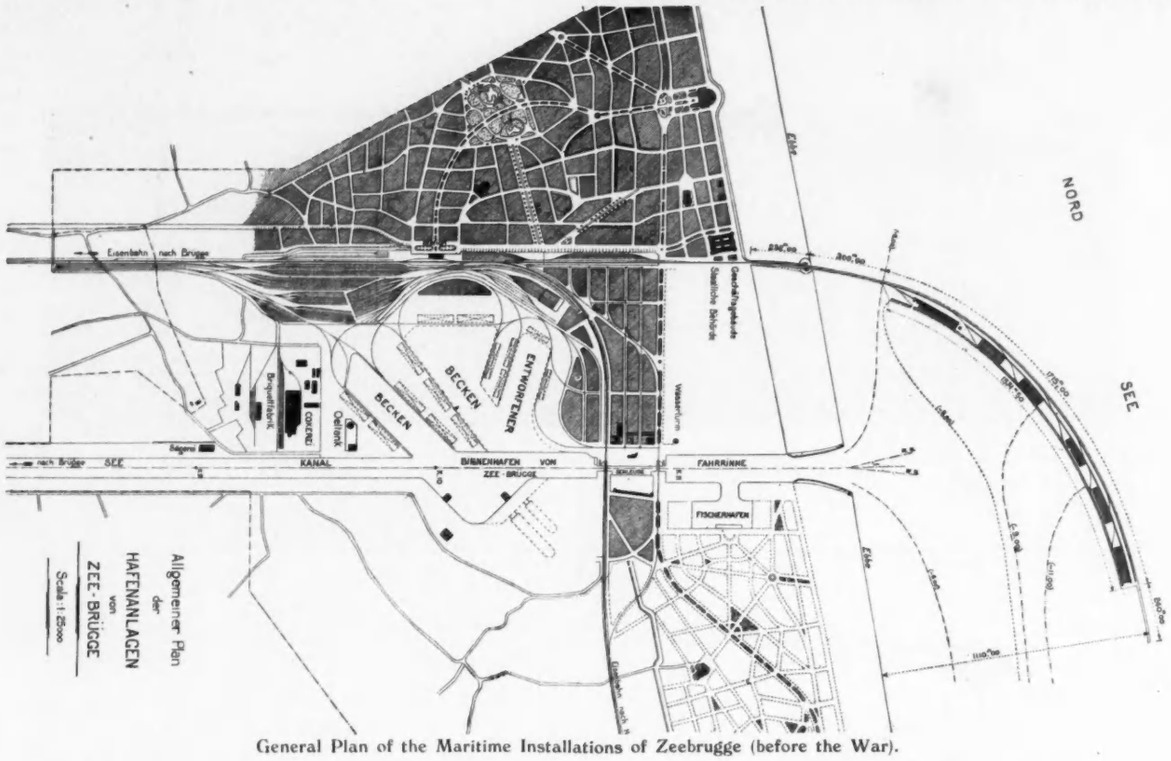
Sea-lock Zeebrugge: Inner Harbour and Sea Canal looking towards Bruges.

At the upper extremity of the west dock is situated the semi-Maritime Lock connecting the new docks with the Ostend Canal, the Old Dock at Bruges and the Inland Waterways.

Its total length is 364-ft. 3-in., the length between gates is 319-ft. 6-in., the width is 39-ft. 4-in. and the depth of water over sills is 15-ft. 6-in.

Negotiations are pending with the Belgian Government for the purpose of obtaining fresh capital in order that the dock accommodation may be improved.

It is noteworthy that this Dock Estate is the only one in Belgium which is not worked by Government or Municipal Authority; the concession for a duration of 75 years having been granted to a private company. Both the government and the Bruges Municipality are, however, shareholders, and hold in fact the majority of the capital.



General Plan of the Maritime Installations of Zeebrugge (before the War).

SHIPPING RETURNS.

	Number of Vessels.	Moorsom Tonnage.	Inward Cargo.	Outward Cargo.
BRUGES.				
1907 ...	497	190,489	216,215	83,724
1913 ...	623	281,255	301,257	314,867
War period—No traffic.				
1922 ...	653	236,014	370,004	99,700
1923 ...	666	264,143	395,502	108,625
1924 ...	671	253,797	344,162	148,913
1925 ...	674	279,571	375,954	157,959
1926 ...	1024	319,313	150,553	415,362
1927 ...	743	327,979	465,452	316,477
1928 ...	733	312,696	355,520	274,284
SHIP CANAL.				
1907 ...	98	107,215	196,724	—
1913 ...	263	207,641	430,827	425
War period—No traffic.				
1922 ...	8	7,758	15,737	—
1923 ...	68	83,678	169,154	—
1924 ...	51	67,135	133,264	75
1925 ...	100	135,105	276,182	—
1926 ...	58	70,319	140,633	—
1927 ...	104	138,013	273,488	100
1928 ...	97	131,125	261,713	5
ZEEBRUGGE.				
1907 ...	156	124,435	16,534	2,197
1913 ...	57	63,701	22,024	677
War period—No traffic.				
1922 ...	135	139,876	690	6,032
1923 ...	66	62,386	2,504	827
1924 ...	262	325,850	847	30,036
1925 ...	388	491,872	12,964	81,297
1926 ...	556	733,256	26,471	144,347
1927 ...	576	729,473	18,832	137,039
1928 ...	652	743,050	45,284	167,186

Trade at the port came to a complete standstill at the time of the German occupation in October, 1914, and the whole system of docks having been systematically destroyed when the Belgian Coast was won back, shipping was not able to return until March, 1921.

Only opened to traffic in 1906 and severely handicapped as a result of the war, the Bruges-Zeebrugge dock system has in a short space of time come to occupy the third rank among Belgian ports.

Its total returns represent about one-twentieth of the trade of Antwerp and one-half of the trade of Ghent, both very much older ports.

IMPROVEMENTS.

Owing to financial difficulties, the Compagnie des Installations Maritimes de Bruges, under whose authority the Dock Estate is worked, has been unable to effect improvements for a number of years with the result that the port is insufficiently equipped both as regards quayage accommodation at Bruges and discharging gear both at Zeebrugge and Bruges.

Zeebrugge Harbour was built at the expense of the State; the lock, ship canal and docks at Bruges belong to the town.

On its own estate at Zeebrugge, the government has recently decided to carry out at its own expense a considerable improvement which will greatly facilitate access to and from the mole, and, it is also hoped, will lessen the amount of silting. This undertaking is the closing of the bridgework approach to the mole. Independently of the fact that in stormy weather access to the mole was precarious, the bridgework approach was very seriously damaged as a result of the explosion of Submarine C.3 on the 23rd April, 1918. As complete repairs were not deemed possible the decision has been taken to build two walls enclosing the bridge and to fill up the enclosed site with sand, thereby affording an additional width of 25-ft. This will carry a double railway track, a paved roadway and a footpath and enable a connection with the electric light railways running along the coast to be laid down. The contract was placed in December, 1927, and it is hoped that it will be completed in 1930.

The Zeebrugge Coke Works are erecting a new battery of coke ovens due for completion at the end of 1929 and which will increase the present production of 600 to 1,500 tons of coke daily with a proportionate increase in the output of sub-products.

ICELAND BROADCASTING AND METEOROLOGICAL STATION.

The Marconi Company has obtained from the Iceland Government a contract for the first broadcasting station to be erected in Iceland.

This station will be situated at Reykjavic, the capital, and is to be completed in time for the thousand years anniversary of the discovery of the island, which will be celebrated in June next year.

The transmitter will be of a new design based on the wide experience of the Marconi Company, which has supplied wireless broadcasting stations for service in over twenty countries. It will have a power of 15-kw. in the aerial and will work on a wavelength of about 1,200 metres.

Special circuits will be incorporated to enable it to be used for telegraphic transmission as well as broadcasting. This will enable the station to be used for meteorological services.

Meteorological information from Iceland is of great importance in forecasting weather conditions for Europe and the Atlantic. The power of the new station, which the Marconi Company is building, will enable meteorological reports from Iceland to be received over a wide area. It will thus form an important addition to the meteorological services.

The Port of New Orleans.

Present-Day Facilities at America's Second Largest Shipping Port.

As a shipping port, New Orleans, illustrated in the accompanying photographs, is now officially ranked as second only to New York, reserved entirely—as a result of the Treaty of Madrid—to public ownership and operation; where the Dock Board, the agency of the State of Lousiana, which owns and operates the Port of New Orleans, has installed facilities valued to-day at more than $100,000,000, available without favour to all who might choose to use them.

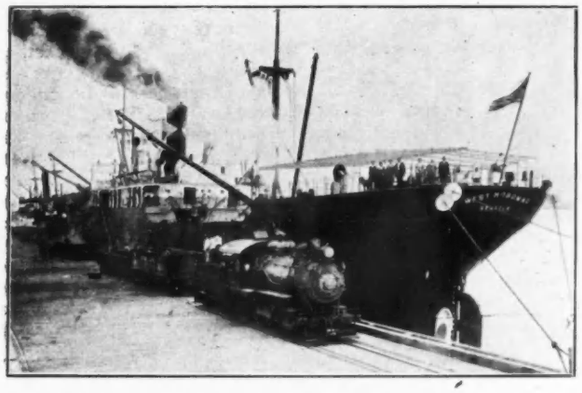
With the completion in 1921 of the Inner Harbour Navigation Canal, built to connect Lake Pontchartrain with the river, at a cost of $20,000,000, the water-frontage of the port was increased to 52 miles. Engineers say this industrial canal ultimately will be the link for a direct channel to the sea through Lake Borgne.

Again, the canal with its great locks on the river side for lowering vessels from river level to sea level, sometimes a drop of 15-ft., was built by General Goethals, builder of the Panama Canal. It has 75 per cent. the capacity of the bigger lock at Panama.

The main feature of the canal is that it provides waterfront sites for industries at a fixed level away from the current in the river.

Other units in the model equipment of the Port of New Orleans are:—The Public Grain Elevator, holding 2,600,000 bushels of grain; the Cotton Warehouse and Wharf, with capacity for 380,000 bales, and a number of high density compresses; a bulk commodity handling plant; a coal tipple; seven miles of covered wharf sheds, including the newly-completed $2,000,000 coffee terminal; the steamboat landing; the lugger landing; the banana conveyors; the fire tug "Deluge," the finest piece of fire-eating aquatic machinery in the world; and the Federal barge terminal.

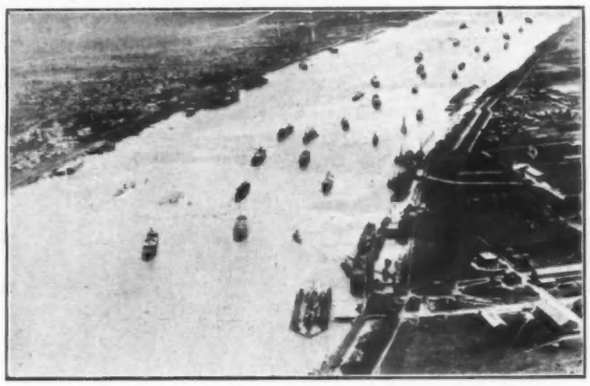
Other features of the port of interest, not publicly owned, are the great dry docks, the Chalmette slip, the Shipping Board "bone yard"; the big railway ferries and the largest car ferry in the world, which commenced operation in December, 1928, between Belle Chasse, just below the city limits, and Cuba, carrying 95 loaded freight cars each trip; and ample privately owned public warehouse facilities for all commodities.



UNLOADING ALUMINIUM ORE AT STUYVESANT DOCKS.

This scene showing shipside-railroad facilities tells an effective story of the close co-ordination between rail and water carriers which has made New Orleans the Nation's Second Port.

Photo by Franck.



THE ANCHORAGE.

The 52 miles of deep water frontage of the New Orleans harbour makes it rarely necessary for ships to await assignments to berths. This view, however, shows an unusually large number in the anchorage.

Photo by Harvey.

The river in front of New Orleans reaches a width of close on 2,000-ft. and a depth of nearly 200-ft. The current flows at four to six miles.

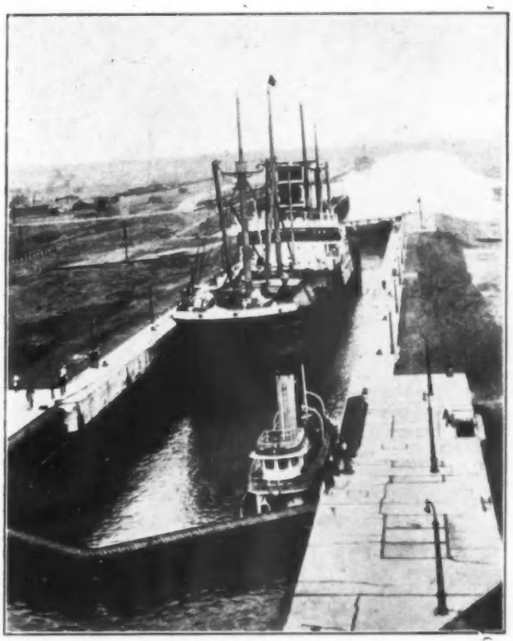
The tonnage of the port in 1927 was 7,697,000 long tons in foreign commerce alone, and second only to New York.

The city excelled all other ports in the exportation of the following commodities during 1926 (the latest year for which figures are available): Canned sausage, canned shellfish, corn, rice, bran, dried beans, onions, vegetable oil, lard compounds, vegetable soap stock, dark fired tobacco, sisal cordage, hair manufactures, creosoted ties, dressed pine lumber, ash, gum, hickory, oak and mahogany lumber, tight staves, barrels, plywood sash and blinds, wall boards, gasoline, carbon black, zinc, and concentrated and acetate of lime. In sixty other lines of exports New Orleans was second in volume.

FEDERAL BARGE TOW.

These tows often contain as many as 17 barges, holding 400 carloads, 10 trainloads of merchandise. They leave New Orleans for St. Louis and the upper river every 5 days and in 1928 carried close to 2,000,000 tons of merchandise on the Mississippi between New Orleans and St. Louis.

Photo by Charles L. Franck.



NAVIGATION CANAL AND GOETHALS LOCK.

Transferring a ship from the Navigation Canal to Mississippi River; or from river level to sea level, it sometimes means a drop within a few minutes of 15 feet; built by General Goethals immediately after he finished the Panama Canal and called by him his greatest achievement since the Panama Canal; this lock has 75% of the capacity of any of the Panama Canal Locks.

IMPORTS.

During the same year it excelled in the following: Bananas, molasses, sugar beet, seed, sisal, waste bagging, gasoline, illuminating oil, bauxite (aluminium ore), and creosote oil. In 25 other lines of imports the city was second in volume.

The commerce of the port is developing so rapidly that, according to Dock Board officials, it is necessary to add 2,500 lineal feet annually to the wharf equipment.

The Federal barge line now handles between St. Louis and New Orleans a total of more than 1,250,000 tons of valley commerce.

The annual importation of bananas totals more than 23,000,000 bunches, while every third cup of coffee drunk in the United States comes in over New Orleans wharves.

The city is considered by those in authority one of the safest ports in the world, because the current in the river is never swift, the sands of the river banks are harmless in event of grounding, the river is wide and permits safe navigation in such foggy weather as occurs in this part of the States. Again, it is rare that high winds are ever felt, and the system of docking, especially the absence of piers, makes handling of ships easy.

Fed by great industries and a bustling port, it is not surprising that across Canal Street—the most interesting of all main streets, beside and around the old city—there has grown the south's greatest metropolis, with great banks whose resources total more than $300,000,000 and which handle annually more than $4,000,000,000 in cheques against individual accounts.

Within two or three blocks of the corner of Gravier and Carondelet Streets, many of the greatest enterprises of the grown South of the United States are financial institutions with resources totalling more than $300,000,000.

In this centre, in the animated pit of the New Orleans Cotton Exchange, the south sells its cotton. Into the city and out every year there pours a transient population of more than 500,000 visitors.

Installation of Dock Fire Pumps.

It is important to see that stationary fire pumps installed at docks are properly mounted and connected up. Generally speaking, the firm supplying the pump will give invaluable advice on the proper installation and operation of their pumps, e.g., Pulsometer, Allen, Sulzer, Weir, Holden and Brooke, and the other firms, all of whom can be relied upon to produce a first-class job. The following hints may, however, be useful.

Prepare a concrete foundation with the surface ½-in. lower than the level at which the pump is to be installed to allow for the final levelling and grouting. See that the foundation bolts extend above the concrete according to the dimension sheets of the pump. The bolts should be threaded at least 6-in., and should be set in the concrete in gas-pipe thimbles of such size as to allow a clearance of ½-in. between the bolts and their thimbles.

Place the pump on the foundation with the bolts extending through the lugs on the bedplate. Level the pump carefully in every direction by wedging under the bedplate. See that the revolving parts of the pump will turn over easily by hand after the packing in the stuffing boxes has been loosened. Fill under the bedplate with at least ½-in. of cement grouting. When the grouting is hard, tighten the foundation bolt nuts, being careful not to spring the bedplate. When the nuts are tightened up see that the pump shaft still turns easily by hand.

Do not attach any piping until the pump has been properly erected and turns freely and the grouting is hard. After the piping is attached, do not spring the pump out of alignment when tightening up flanges and fittings.

In selecting the piping, do not overlook pipe friction, especially if the pipe lines are long. All pipe friction means extra power to drive the pump, and where this friction would be a considerable item it is usually advisable to reduce it by selecting a larger pipe. All unnecessary bends and elbows should also be avoided, as they increase the pipe friction.

Never use smaller pipe than the size of the pump suction opening; but with a suction lift of 10-ft. or more and a length of pipe exceeding 20-ft., or with more than two elbows, suction pipes 2-in. larger must be used, and a special reducing casting must be supplied to connect with the pump. Never attempt a suction lift of more than 15-ft.

Always place the end of the suction pipe at least 3-ft. below the surface of the water to prevent air from being drawn into the pump. Avoid air pockets in the suction piping and make sure that the suction pipe is absolutely airtight. If the suction pipe is not in a vertical position, it should slope downward and never upward toward the water if there is any suction lift.

It is desirable, especially where there is pressure on the suction side of the pump, to place a gate valve in the suction pipe near the pump so that the capacity of the pump can be controlled to some extent on the suction side. It is also advisable to place a strainer on the end of the suction pipe to prevent large pieces of debris from entering the pump.

Place a check and gate valve in the discharge pipe, as close as possible to the pump. The check should be placed next to the pump.

Run the pump in the direction indicated by the makers.

Do not attempt to run a motor driven pump from a trolley circuit, as the line voltage of such circuits is exceedingly variable. The speed of a d.c. motor varies almost directly with the voltage, and the capacity of a centrifugal pump varies greatly with changes in the pump speed. If the pump is designed to run at the speed corresponding to the motor speed at maximum voltage, it will deliver little or no water when the voltage is low. If designed to give the desired capacity at the motor speed at minimum voltage, the motor will be seriously overloaded when the voltage rises to its highest point.

Do not attempt to run a centrifugal pump when empty. A centrifugal pump will not lift water by suction until it has been filled with water and the air removing from the casing—an operation known as priming. Any of the following methods of priming may be used:—

1. If possible, place the pump so that it will be under a slight head on the suction, so that water will flow into the pump by gravity, and it will be primed at all times. This can be accomplished by connecting the pump directly to water mains or by placing it below the level of the reservoir from which the supply is to be drawn. In either case, a gate valve is necessary so that the supply can be shut off in case it may be necessary to inspect the interior of the pump.

2. When the pump must work with a suction lift, attach a brass-fitted foot valve to the lower end of the suction pipe and fill the suction pipe and pump casing with water from an independent source, as follows:—

(a) Provide a priming tank with a capacity at least three times as great as the volume of the pump casing and suction pipe (in no case less than 250 gallons). A liberal sized tank and pipe are required so that quick priming will be ensured even with a leaky foot valve. Connect the tank to the pump at the top of the discharge casting so that the priming water will enter the pump direct and not be wasted in the system. Provide a straightway outside screw and yoke valve and a swing check valve in the priming line. The necessary sizes are:—

Size of pump (galls. per minute) ...	500	750	1,000	1,500
Size of priming pipe for suction pipe not over 25-ft. long. If longer, larger connections should be used	2½-in.	3-in.	3½-in.	4-in.

Means must be provided for keeping the priming tank filled at all times, either by an auxiliary pump or a connection to the water mains through a good ball and cock control.

(b) Where there is no danger of freezing, connect a line from the water mains to the priming opening of the pump with a check and gate valve. The pump is then always primed and ready to start instantly.

(c) Where a reliable supply of steam or compressed air is available, a large exhauster or ejector can be used to exhaust the air from the suction pipe and pump casing, after closing all valves on the discharge side of the pump. In such a case, a foot valve is not necessary.

(d) An independently driven vacuum pump can be used instead of the ejector as under (c).

In case the pump is primed by any means othen than (c) or (d), the air cocks at the top of each stage must be opened, and the priming water should not be allowed to enter faster than the air escapes through the cocks, otherwise air pockets are liable to form.

After the pump has been primed by this means, the pump shaft should be turned slowly a few times by hand to allow the air to escape from the impellers. Do not close the priming valve until the pump is started, but close it immediately the shaft begins to turn. Close the air cocks when the pump is up to full speed. The discharge valves should be kept closed until the pump is up to full speed, and then gradually opened.

Do not draw the glands up tight, but always allow a reasonable leakage through the stuffing boxes and glands. This indicates that water is being supplied to the water seal ring which is placed in the stuffing box, and prevents air from being drawn into the pump. Usually the nuts on the gland bolts can be turned sufficiently tight with the fingers.

Pipe the stuffing box drip pockets to a drain, or some other convenient point where the water can be wasted.

After the pump is installed, clean the bearings out thoroughly with paraffin or petrol, and see that there is no dirt or grit in the bearings or oil reservoirs. Fill the oil reservoirs with a high-grade oil.

The pump should be turned over a few times under its own power at frequent intervals to make sure that everything is ready for instant service at any time it may be needed.